A TREATISE OF Lithotomy: OR, Of the Extraction of the Stone out of the Bladder.

Written in *French* by Mr. *Tolet*, *Lithotomiſt* in the Hoſpital of the *Charity* at *Paris*.

Tranſlated into *Engliſh* by *A. Lovell*.

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M. DC. LXX XIII.

To the Ingenious and Expert Chirurgeon, Mr. Tho. Hobbs, *Lithotomiſt in the Hoſpital of St.* Bartholomew *in* London.

SIR,

I Confeſs it is but a weak Apology for my Confidence in prefixing your Name to this Book, to tell you that I can more eaſily ſatisfie the World, than your ſelf in making this Dedication; though indeed it be all that I have to ſay for my ſelf,

for this Trouble I give you. The truth is, Sir, ſince moſt Books now a-days do court, what but a few deſerve, I mean, Protection; as I would not be ſingular in Publiſhing this Tranſlation without a Patron, ſo I durſt not be ſo unjuſt to the intrinſick value of the Treatiſe, as to ſend it into the *Engliſh* World no otherways provided than with the Credentials of a ſpecious recommendation to the train of ſome great

great Man, who, perhaps after all, would not admit it into his Family without your Approbation. It was therefore in imitation of the Ingenious Author of this Book, who gave me a Precedent for Dedication, that following the guidance of Univerſal, and therefore leaſt erring Fame, I was led to your Door, there to leave this Foreign Child, which I have taught to ſpeak (I hope) intelligible *Engliſh*, to be by you diſpoſed of

in

in the World, according as you ſhall think it deſerves, & as you are pleaſed to give it a Character. If it may be able to ſerve thoſe that ſerve you in that Famous Hoſpital, where you ſucceſsfully Operate, or prove Uſeful to any that profeſs *Lithotomy*, that laudable, but difficult and dangerous part of *Chirurgery*; you are in the judgment of moſt men the fitteſt Judge; ſo that the Publick (I make no doubt) will juſtifie my Con-

Conduct in ſubmitting it to your Cenſure. But, Sir, how you your ſelf will Interpret this attempt of mine, I dare not affirm; ſeeing Fortune hath not encouraged me to it by intitling me to thoſe freedoms that mutual Converſation & long Friendſhip do allow: However, Sir, I will not deſpair but that the kind Acceptance my endeavours ſhall meet with in the World, will ſo far interceed for me, that what is intended, and really

ally found to conduce to PublickGood, will not be thought by you to want any private Motives to commend it to your Patronage. I shall say no more, lest by seeming to know you better than indeed I do, I should spoil my own Plea, and appear to be an Intimate Friend, when in reality I am,

Sir,

Your Humble Servant,

A. Lovell.

London, Sept. 23. 1682.

A TREATISE OF Lithotomy: OR, Of the Extraction of the *Stone* out of the *Bladder*.

CHAP. I.

What is meant by Lithotomy.

Lithotomy, according to the Etymology of the word, signifies Cutting of the Stone. It had been a more proper way of speaking, to have used a term that might have expressed the part which is opened by the edge of

the Inſtrument, becauſe the diviſion or cutting of the Stone happens contrary to the intention of the Artiſt; however I ſhall make uſe of the word *Lithotomy*, which is in vogue, and underſtood by all that are skilful in the Profeſſion. That we may dive into the meaning, and give the definition of the thing; it is an Operation in Chirurgery, practiſed for the Extracting of Preter-natural hard Bodies which are retained in the Bladder.

By Preter-natural Bodies is to be underſtood, all things that are retained within the Body of Man contrary to the ordinary courſe of Nature: And ſeeing ſometimes there are ſeveral things in the Bladder which require the opening of it, we have put in the definition Preter-natural Bodies, rather than the Stone; and for clearer diſtinctions ſake, we have ſubjoyned that *Lithotomy* is only practiſed for ſuch as are hard, and retained in the Bladder.

CHAP.

CHAP. II.

Obſervations upon the Parts of the Body of Man.

THE Veſſels and Pores of the Glandules are the uſual Conduits through which the *Corpuſcules* or little Bodies paſs and are filtrated, when their bigneſs and figure makes them fit to be received there; but if there be no proportion betwixt the Conduit-pipes and the Liquors which ſhould paſs through them, they ſtop: On the contrary, if the Humours have a very rapid motion, they diſtend the paſſages, and many times break them.

Whatever the impulſe of the Humours may be, their motion abates the more that they communicate it; they make no ſenſible attempt to get out when they are moved on every ſide in a place that can ſtretch and be enlarged to a certain bigneſs, as the Bladder and the Baſons of the Kidneys: But when the place wherein they are contained is full, if they be not

evacuated, they are the cauſes of ſeveral Diſeaſes; for the Humours conſiſting of parts of different figure or bigneſs, it follows that ſometimes they cannot glide through one and the ſame paſſage. It is true that Bodies of the like or different extent may paſs through one and the ſame Channel; the contrary is not impoſſible, and may give a beginning to thoſe Tumors, which ſwelling outwardly higher than the ſurface of the Body, go by the Name of *Abſceſſes*, after the ſame manner as the internal collections have other appellations: And if the ſame Humours be compoſed of unequal parts, and meet together in a narrow place that is full of windings, ſome of them joyn together, and by their conjunction form a Body that in reſpect of the reſt is ſolid. This Body by its continuance there, and the appoſition of other *Corpuſcules*, becomes more ſenſible to us; it hardens according as the rough parts cloſely embrace one another, and the other ſeparate and continue their motion.

After the ſame manner as it is in Brooks and Rivulets, where the ſmall ſtones

ſeparate

ſeparate and retain the Mud; ſo is it in the Glandules through which the Humours are filtrated: And in the Pipes where Water runs in great quantity, though they be ſtreight, Earth and other Sandy ſubſtances mingled with the Water cleave cloſe and ſtick together, and there form a ſtony Cruſt, which in time hinders the paſſage of the Waters.

CHAP. III.

Of the Cauſes of the Stone.

OUR Food liquified is not deſtroyed, and the diverſity of Aliments makes it apparent, that they have parts different in Bigneſs, Figure, and Number; the moſt Nouriſhing, as Jellies and ſtrong Broths have all theſe qualities, ſeeing the Juices of Animals which are the baſis of them are taken from the ſoft and hard parts of the Bodies with which they were aſſimilated, or being ſtill within the Veſſels and amongſt the Glandules, tended to that aſſimilation; or from thoſe Bodies that were to be retained or voided,

by Phyſicians called *Retenta* or *Excreta*.

Other kinds of Food contain alſo parts of a different Nature becauſe Elementary Bodies are mixed, ſo that a ſimple unmixt Body is not to be found. The Air wherein we live, and which we breath, is full of little Bodies ſeparated from different Subſtances, and contributes to our Health and Sickneſs. If then, one breath a thick and groſs Air, if he drink thick and rough Wines that are not fine, muddy Waters of Lakes into which ſeveral Brooks empty themſelves, or ſuch as Petrifie other Bodies, or Snow-water, which contain matters that being frequently drank may leſſen the motion of the Humours; if he eat a great deal of unleavened Bread Water-fowl, Curds, Pap, Old Cheeſe, hard Eggs, ſtony Fruits that are tart and not fully Ripe; as Quinces, Medlars, Pears; if he feed on Beef, Pork, or the Legs and Feet of Animals, Eels, Salt and Spiced Meats; or if he frequently make uſe of Medicines which cauſe the more ſubtile parts to tranſpire, as Sudorificks and Diureticks: If he beſtir himſelf too violently at any time,

and

and especially after eating. The long use, or the excess of these things, will be the cause of the Stone; as likewise too much idleness, and sleeping too long upon the back, because the Earthy parts of gross Food may meet together in several places, and disturbing one another, stop the passage.

If those who take the greatest care of their Health, are not exempted from Living on Food which contains slimy parts, as strong Broths, what may we think must befall them who to excess eat and drink indifferently of all things, or indeed but to Moderation, since our Victuals participate of a Terrestrial Matter mingled with a kind of Salt; and Chymistry teaches us, that in the Body of Man there are some Juices which dissolve and liquifie our Food, and others again that thicken it; whence it may be concluded, that if the one of these Liquors by mingling with our Food, renders it fluid; but then being confusedly hurried away, and conveyed by streighter passages, it may be that the same Liquor does escape, and more easily glide away

than the Nouriſhment that is retained in, and does Nouriſh the part, or even deſtroy it, according to the proportion or diſproportion of the Humours which in general may be called Alimentary. It is much the ſame if a Terreſtrial Juice remain with the Food after Chylification; for being circulated through all the parts of the Body, if it tranſpire not, it will clog and obſtruct, and many parts of the ſame Nature joyning together, will there produce a Stone.

CHAP. IV.

Of the Conſequences that are drawn from the foregoing Chapter, and how the Stone is defined.

THE Blood is carried to all the parts of the Body; but if its motion be more rapid than is uſual, it may diſtend the Capſules and Ureters, and make ſome drops of Blood fall into the Bladder, or other groſs Particles mingled with the Urine, which will then be red, bricky, and gravelly.

People

People do not always make water ſo ſoon as the Seroſity is ſeparated from the maſs of Blood: If there be a ſmall Stone in the Kidney it may ulcerate it: It deſcends towards the head of the Ureter, and when it is rough or of an exceſſive bigneſs in reſpect of the narrowneſs of the paſſage, it ſtops it, or by the impulſe and force of the Urine that follows, making a great dilatation, it opens a paſſage for it ſelf unto the very Bladder, the patient in the mean time, ſuffering moſt violent Nephritick Colicks, which ſometimes are the cauſe of his Death. On the contrary every ſoft part having a peculiar ſenſe of feeling, if the Kidneys have no exquiſite feeling, and the Urine or ſmall Stones have by little and little dilated their paſſages, the Glandules will ſeparate and retain but a very ſmall matter, all that was contained with the Blood will paſs through; and as through a Seive, ſeveral ſorts of grain may paſs after that the holes are enlarged, ſo Gravel and little Stones may be conveighed into the Bladder, with the Urine, and the

Patient

Patient hardly feel any pain or trouble.

It is to no purpoſe to alleadge that the dryneſs, or cloſe Union of the parts that compoſe the Kidneys does contribute to the forming of the Stone; becauſe in the Dead Bodies of thoſe that have been troubled with the Stone, it is to be obſerved that the Kidneys are moyſt and ſoft; and it is certain that in living Bodies they are continually moiſtened with ſome Liquor: And beſides it cannot be ſaid that their Bladder is narrow and dry, although Stones are more frequently formed there, than in any other part of the Body.

It is unjuſt to accuſe our Parents, to make us bear more patiently the pains we ſuffer, becauſe in every body the cauſes of the Stone may be ſufficiently evinced, without imputing them to thoſe to whom we owe our life, and without blaming of them, reaſon may be given, why we ſee Children ſubject to the Stone, whoſe Fathers and Mothers enjoy perfect health.

We are to conclude that Age and Exceſſes render the parts weak, whoſe Fibres

Fibres being relaxated give occaſion to obſtructions in Old People, as well as in Children; becauſe the abundance of humidity ſlackens the motion, and the earthy, ſlimy, and ſuperfluous matters, that are not evacuated, occaſion ſeveral diſeaſes, as well as the Stone.

Many diſtempers are bred according to the diverſity of the food that one takes. Thus a man ſhall be afflicted with the Stone, if he feed on courſe food, and which may eaſily coagulate in the Body. There are not wanting ſad inſtances of this; perſons of different Ages, Sexes and conditions, are ſubject to it, and moſt of thoſe who are troubled with the Stone, and who are to be ſeen in the Hoſpitals of *Paris*, come from the Country, where moſt part of their food is terreſtrial and courſe; and many little Children who live in that manner are cut there.

Stones are formed in all the parts of the Body, and according to their dimenſions that which ſtops the paſſage takes the name of Sand, Gravel, or Stone: experience confirms this; for

Stones

Stones are found in the Lungs, the Liver, the Gall, the Spleen, the Kidneys, &c. *Paræus lib.* 25. *Chap.* 15. reports that he took one out of a mans Knee. Some are found in the Heart: those *which are found in the Nerves* are by *Paulus Ægynæta* named *nodosæ nervorum concretiones*, knotty concretions of the Nerves. It is likewise observed that Stony crusts are formed about the Teeth. I know a man that above twenty years ago voided one by the Navel: it was of the bigness of an Olive Stone; and the man is still alive.

Stones are bred most frequently in the Kidneys and Bladder, because these parts are appointed for separating and containing the serosity which always carries along with it an earthy Sediment that accompanies the Urine; and the Stones of the Kidneys and Bladder give greater pains to the Patient, because they stop the emission of Urine; or irritate the parts whose use is frequent, and the sense more exquisite than that of many others.

In a word, we may conclude, that the Stone is a preternatural hard body, begotten

begotten of the terreſtrial and ſlimy *parts of* our Food.

We have put in the definition the word ſlimy, to diſtinguiſh it from Viſcous, becauſe Viſcous things do not harden in a place where there is moderate heat and humidity: but ſuch as are ſlimy, like the White of an Egg, by little and little grow hard, and incorporate with the earthy parts they contain, when they have long continued in luke-warm Liquors.

This propoſition may be confirmed by the experience of thoſe who render an Oyly and Fat Urine, and who are not troubled with the Stone; and becauſe unctuous and viſcous Medicins, ſuch as Turpentine, give eaſe to thoſe that are afflicted with Gravel: Moreover, clear and ſlimy Urine is reckoned among the ſigns of the Stone in the Bladder.

Authors are divided about the deciding of the queſtion whether or not the Stone be a diſeaſe if all their reaſons be conſidered, it may take the name of a diſeaſe, as well as that of a cauſe.

CHAP.

CHAP. V.

How Stones are formed and grow in the Bladder.

THere needs no more but a grain of Sand, or any hard Body to ſerve for a Center or Foundation for monſtrous Stones, which cauſe terror in thoſe that behold them, and moſt frequently death to thoſe from whom they are taken.

The Sand, and other things that are mingled with the Urine, ſometimes are not wholly voided out, their continuance within gives time to what remains to gather together in ſome place; and after that one hath made Water, if there be ſtill in the Bladder a little ſand and ſlimy ſubſtance like the white of an Egg, preternatural heat and the ſeparation and evacuation of the humidity make them joyn together in the ſame manner as the Saline and Tartarous parts of Wine; and the Urine of thoſe that are troubled

troubled with Gravel which diſtills into the Bladder, being mingled with other Terreſtrial parts, furniſhes matter that joyning with that which remained there before, forms and augments the Stone: Experience informs us that Stones are ſometimes found which are in a manner like a mixture of Sand with the Whites of Eggs, having ſo little Solidity, that one cannot avoid the breaking of them betwixt the Teeth of the Forceps.

If a little Sand may be the Center or Kernel of the biggeſt Stones, a hard body got into the Bladder and remaining there, may likewiſe be as we have ſeen in an *Italian* Souldier; who to eaſe himſelf of a pain that he felt, thruſt into his Yard the Tag of a Point about Two Inches long, which ſlipt into his Bladder, and there continued Eight Months. In the Spring of the year 1677, he came to the Hoſpital of the Charity at *Paris*, where without much minding the relation he gave of his condition, I was aſſured by the cathe-ter that he had a Stone in the Bladder,

he

he was cut, and the Iron Tag taken out; about which a Stone was formed, that hindred not but that it might be seen in several parts. *Parêus, lib.* 25. *chap.* 15. Reports a like case. *Fabritius Hildanus L. de Lith. c.* 3. *col.* 2. writes that one of *Geneva* having for the space of Twenty Eight years complained of the Stone, at length died, and that he was found to have a Stone, the Kernel of which was a Leaden Bullet petrified, which he had received by a Musket-shot, and retained all that while. *Joseph Covillart, Obs.* VII. of his operations, assures us that he had seen a Stone, the Center whereof was a Musket Bullet which a Gentleman had received in the Bladder, Five years before he was cut of it.

I had in cure a young man, who had been cut at the Age of Four years Old, and who was troubled with a Fistula: since that time he had discharged Urine unto the Scrotum, where by degrees a Stone was formed about the bigness of a little Pullets Egg, ending in a point like the Stalke of a Pear.

It

It cannot be determined how long time the Stone is in forming and growing; that depends upon the conjunction of the parts of the Sand, and the ſudden and quick ſecretion that is made of it in the Bladder: beſides, it may be, the Stone continues at a certain Size, becauſe new Corpuſcles do not always cleave and ſtick to it. I know one that hath had one for ſeveral years, ſeated in the beginning of the *Perineum*, near the *Scrotum*, without any ſign of dilatation or ſenſe of Pain.

The growth of Stones in the Bladder happens not without alteration of that part; which becomes weaker according as the Stone increaſes.

This remark affords us a reaſon why the Bladder of thoſe that are troubled with the Stone is thicker than naturally it ſhould be, which is only cauſed by the debility of the part; becauſe not being able to ſend back the ſuperfluous part of the Blood, it ſwells therewith as the womb in Women when they are with Child, and the parts where there hath been a Fracture, a great Contuſion

or a Wound ; and in the ſame manner as by Suppuration, or the Tranſpiration of Wounds, Fractures and Contuſions, or the Evacuations that happen after a Woman is brought to bed, the parts return to their natural thickneſs, ſo the Bladder being diſcharged of the burden that incommoded it, and beſides aſſiſted by Medicins and a regular Diet, is reſtored again to its former ſtate. *Bev. c. 4. de Cal. Ren. & Veſic.*

CHAP. VI.

Of the differences of Stones.

THE moſt conſiderable difference in *Stones*, *is in reſpect of their magnitude.* The leaſt Stones of Children of Three, Four, or Five Years Old, are like great Peaſe; or of the bigneſs of Cherries. Thoſe of Seven, Nine, Twelve to Fifteen Years Old, have them a little bigger. In men grown up, who are of Middle age; and in Old men to the laſt period of life, Stones are found of the bigneſs of a Hens Egg.

I pretend not to determine the exact Size of the Stones of every Age, there is no rule for it; and it is ſufficient to remark what is commonly obſerved; for ſometimes ſmaller Stones are cut from Children and Men, and at other times ſome of ſuch a bigneſs that with relation to the ſubject, they are called Monſtrous.

The thing contained gives ſometimes the Figure to that which environs it, but Stones rather take than give it. The Bladder, the Urine, or the Preſſure and Juſtling of other Bodies, are the cauſes of many differences; do not we ſee that water hollows Rocks, though it fall drop by drop? It may be obſerved when the Stone is formed by minute Bodies that have Angles, the Urine or the Salt of it blunts the points of them, and the wet Sand not having firmneſs enough, lyes flat by the ſides of the Bladder when there is little Urine in it, and forms a flat and ſmooth Stone, approaching to the Oval Figure of the Cavity of the place, but if the minute Bodies of the Stones are Round, they

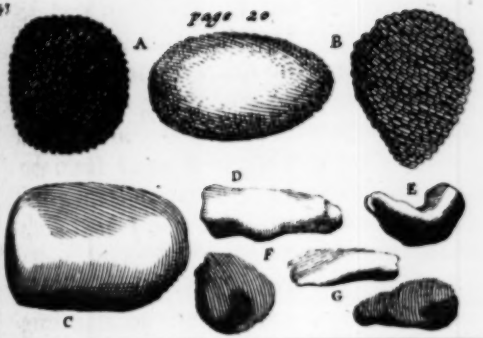
Roll in the Bladder from one ſide to the other; and when they joyn together and are dry, they make rough Stones of a Spherical Circumference, with very great Pores; as is repreſented by the Figures, the Superficies whereof are unequal like to Strawberries or Mulberries: On the contrary if they be compoſed of minute Bodies that draw near to a Triangular Figure, the contrary will be found, and they will have ſmoother and leſs unequal Surfaces.

A, B, Gravelly Stones which are the Roundeſt.

C,D,E,F,G, Stones that have no other name then that of the things they reſemble; as an Almond, a Hens Egg, &c.

It is alſo to be obſerved that there are many more flat Stones ſmooth and poliſhed in the Surface, than round and rough: And this makes it probable that moſt of them are formed of minute Particles, the points whereof are blunted.

As the Surface and thickneſs of Stones are not always uniform, ſo their Particles are variouſly Figured or diſpoſed. Indeed there is as little reaſon to affirm that


A
B
C
D
E
F
G

that all kinds of food are of the ſame nature, as that all the things whereof the Stone is formed, are alike: And though it were granted that the Stony Corpuſcles were of one and the ſame Figure; yet the difference of their bigneſs, and of their modification and ſite by reaſon of the inequality of their Angles, which would entangle them one with another, muſt needs give place for greater Pores, than if they were diſpoſed in the manner moſt ſuitable to their nature for making a ſmaller bulk: And beſides, betwixt the great Pores of Globular Corpuſcles, other little Bodies of a different ſhape may enter, which may diminiſh the greatneſs of theſe Pores.

The Corpuſcles of Stones being ſmall, the Stone will have a fine grain and be more poliſhed and ſmooth, the Corpuſcles that are bigg and Globular, make the grain courſe, and the Stones lighter; becauſe their Pores are full of Urine, or of ſome other very ſubtile matter much lighter than the parts of the Stone; hence it is, that of two Stones of the ſame bigneſs the rougher or leſs

poliſhed ſhall be the lighter, and a diſſolving Menſtruum will Act much ſooner upon thoſe which are Globular and unequal, than upon thoſe which are Smoother and more poliſhed in their Surfaces.

When the Stone begins to be formed by Globular Corpuſcles, they are in ſuch ſort diſpoſed, that they contain humidity in their Pores; the Stone in a ſhort time growing in bigneſs, that Water or Humidity is by heat rendered more ſubtile according as the Stone grows harder, and then it acquires a motion that may drive the parts from the Center, and making to it ſelf a paſſage bigg enough to tranſpire through, but too little to allow an entry to other Terreſtrial Corpuſcles, that Stone will he hollow at the Center.

Corpuſcles that come neareſt a Triangle, cement and link the other Particles together; becauſe Triangular and Square Figures, are more capable to hinder motion than *Spherical.*

The Stones whoſe Pores are full of Humidity, are the ſofter, and that ſoftneſs will be more or leſs, according to

to the quantity of Aquoſity contained betwixt the Center and the Surface; and therefore they are called ſoft Stones if there be much Humidity; and hard, if there be none, and that the parts of the Stone be cloſely compacted. It is certain, the hard are heavier than the ſoft.

Sometimes Stones are taken out whoſe Center is Globular, and the Surface ſmooth; the reaſon is becauſe betwixt the Pores of the parts of the Kernel, other ſmaller, and leſs round Corpuſcles are placed, and form a ſtony cruſt which has a finer Grain. On the contrary the minute Bodies having formed an equal thickneſs from the Kernal, if many Globular Corpuſcles joyn with them before the Stone be hardned, it will be unequal and rough in the Surface.

If the Stone be formed in the Kidney, and take its grouth there, it will be Sized according to the ſhape of the Cavities wherein its Branches do extend themſelves. Hence it follows that a Stone formed and augmented in the Neck of the Bladder, will have a Figure Oblong, Cilindrical, or like a Pear, having one

end ſmaller than the other; but if the Particles begin to joyn higher towards the bottom of the Bladder, it is not repugnant but that at the ſame time the Corpuſcles may be ſeparated without touching one another amongſt the Wrinkles and Rugoſities of the Bladder, and there form Stones which change their place, and which by mutual colliſion become ſmooth; as with two Stones of a moderate hardneſs and a little Water we may make the experiment, and they will have one or more ſides flat, as is repreſented in the figures contained in the little ſpace of the former cut.

This may ſerve for inſtruction to thoſe who have not ſeen the operation often performed; becauſe conſidering the ſtones, they will be able to judge if there be many, which are ſometimes uniform, ſometimes unequal in thickneſs. It is rare to find Stones covered with a coat, or ſlimy humor; there are ſome that are ſticking like thoſe which have Prickles and Aſperities, which are called Gravelly Stones, to diſtinguiſh them from thoſe which are Smooth, Round, or Oval. Some are harder

der and more ponderous ; others are gravelly only in the Center, or in the Circumference, ſome are found to be hollow within, and others again ſolid, as in their Superficies differences are likewiſe taken from the Scituation, becauſe there may be Stones in the *Urethra*, the *Perineum*, the neck of the Bladder, the bottom of it, betwixt its Tunicles, in the *Ureters*, the Kidneys, and other parts of the Body. In the gall-bladder ſome are found of a grayiſh colour ; thoſe of the Joints and Phlegmatick Abſceſſes are Whitiſh and thoſe of the Kidneys and the Bladder are Reddiſh, Grayiſh, Whitiſh or of a colour near to theſe.

We muſt not forget the number ſeeing it is ſometimes exceſſive, and that ſometimes there have been found in People ſubject to the Stone to the number of Twenty, Fourty or Sixty ſtones ; but the number is not to be limited no more than the bigneſs, becauſe many Stones may be formed at the ſame time, or ſucceſſively, and the fragments that break off from them by grating, produce other Stones ; and that is the reaſon that ſome are bigger

ger than others. If a Stone have several flat sides, there will be commonly three Stones; there may be also more, or only but two.

Stones that are cut out of Mans body are not so smooth nor so hard as the Pebles of the Earth; And there are not so many adherent Stones as is believed, if you except those that have a coat, or prickles. The smoothest are not extracted without pain if they be large and the passage be not sufficiently dilated, or if they be not rightly laid hold off by the Forceps, or if the *Membranous* parts be doubled through which they are pulled out. It is very hard to judge whether the Stone adheres before the operation.

CHAP. VII.

Of the Diagnostick and Prognostick signs of the Stone.

IF we reflect on the causes of Stones and their differences, we may observe the diversity of their signs, of which the First discover that there is a Stone, the Second if there be many, and the Third if the effects and consequences of them will

will be dangerous. The ſigns that diſcover to us the Stone or the number, are called *Diagnoſticks*, and thoſe which make us judge of the conſequences, are named *Prognoſticks*.

For facilitating the means to know if the Stone is in the Kidneys and that it deſcends into the Bladder, we cannot cite a better Maſter than *Galen*, book vi. of *Places affec. chap.* 2. who deſcribes the ſigns of the Stone different from thoſe of other Colicks. A ſtraining to vomit, and great and frequent vomitings are much more troubleſome to thoſe that have the Colick; and then they vomit more *Pituitous* and Corrupt Matter than thoſe that have the Stone. They are more bound and break no wind neither upwards nor downwards; The Colick ſeems often to move and take up more place, and ſometimes it encreaſes in diverſe parts; but the Stone Colick torments in the ſame place without intermiſſion. And though pain that afflicts a place higher than the ſcituation of the Kidneys be always produced by the Colick, yet it does not follow that that which is fixed in the region

of

of the Kidneys, is an evident ſign of the Stone; that ſcituation ſignifies nothing at all to diſtinguiſh it, becauſe with theſe marks the Urine muſt alſo be examined. Thoſe that are ſubject to the Stone in the beginning render a clear and pure Urine, and in the following days ſomething troubled is to be obſerved which ſubſides to the bottom, and at length it becomes all Sandy and Gravelly; which happens not to thoſe who being free from the Stone, are tormented with the Colick, becauſe if they render any groſs excrements, one would ſay that there were Flatuoſity in them, and many times they ſwim on the top of the water, being of a Conſiſtency like to the Urine of an *Ox*. Moreover theſe great pains of the Colick are much ſooner eaſed by laxative Gliſters, than if they proceeded from the Stone. It happens ſometimes that the Colick ceaſes by the voiding of ſome cold humor, and then it is a remedy that not only eaſes but cures and diſcovers the deſeaſe: In a word, as the one is cured by voiding of cold Humors, ſo the other is delivered from their diſtemper by voiding

ding the Stone with the Urine, and at the ſame time we may know what part ſuffers.

We have ſaid that the Matter of Stones are all kinds of Slimy and Terreſtrial Subſtances linked together according to the Proportion of more or leſs that forms a hard Body. That Stones forced againſt the ſide of the Bladder, cauſe pain, Inflammation, Ulcers, and make one void Purulent matter in the ſame Manner as the Acrimony of Humors, of Urine and Abſceſſes. Little Stones may come out with the Urine: Sometimes they ſtop in the *Sphincter* or *Vrethra*; they hurt the nerves of the neck of the Bladder which terminate in the circle or crown that is the beginning of the Glans; they may in like manner if they be bigg lay upon and preſs the *Inteſtinum rectum* and cauſe an extraordinary weight, becauſe theſe parts are only appointed by nature to bear the burden of liquid things which are leſs ponderous than the Stone. When they have Aſperities, or are covered with a coat, they are detained in the wrinckles of the Bladder: Now if they be very light,

light,and without adherence, they ſioat a long time in the water;but becauſe of that weight they have they deſcend towards the *Urethra*, and the ſmaller they are in bigneſs or the leſs unequal in their Surface, the more they cloſe the paſſage, becauſe the ſmall Stones ſlide eaſily into the *Urethra*, and the Urine may run down between the Aſperities of the Stone. That Obſtruction hinders the paſſage of the Urine and obliges the Patients to lye upon their backs; they haſtily and with violence turn themſelves, to make the Stone change its ſcituation, that ſo they may facilitate the excretion of the Urine; and becauſe pain makes the Spirits move towards the neighbouring parts, theſe are ſo diſtended that Men and young Boys are fain to draw out the Yard and Prepuce to appeaſe the pain, and therefore they croſs their Legs, and preſs their Thighs together: Moreover if the Stone change its place a little clear Urine, or mingled with ſlime comes out: According to the ſame principles it may ſtop the paſſage, which obliges thoſe that are ſubject to the Stone to have often a

deſire

deſire to make water. They are commonly dry, becauſe the Spirits and Humors are diſſipated and ſpent by labour, pain and watching.

By theſe obſervations we may judge that there are ſeveral *Diagnoſtick* ſigns which are equivocal, as the Yard and Prepuce drawn out by the hands of the Patient tormented with Inflammation, pain, and voiding of Purulent matter, by ſharpneſs of Urine aud gravel; becauſe Sandy matter or little Stones having cauſed their ſymptoms, may be evacuated with the Urine; nevertheleſs when that hath a ſediment mingled with Sand and thick Slime, when there is any ſhell of a Stone within, or ſqueezed out of the Yard, it is a pregnant preſumption, which commonly ſerves for a certain ſign.

The univocal *Diagnoſtick* ſigns may be drawn from the ſame obſervations; as a ſudden and fixed pain in the loins towards the one or the other ſide, and ſometime towards both in the region of the Kidneys; after which the Urine looks reddiſh and Sandy, or ſometimes

Crude,

Crude, Clear and Watry, a numneſs of the Thigh on that ſide where the pain is when the Stone is bigg: There is a Flitting and reſtleſs Itching towards the *Pubis* and in the end of the Yard, accompanied with a frequent and ſudden ſuppreſſion of Urine, a pain and heavineſs in the *Perinenm* with a continual heat of Urine, and immediately after the making of water a freſh deſire to do it again. It may be obſerved why there are ſuch violent ſtrainings for a ſtool, and why the Urine ſtops all of a ſudden when one is ſtanding, which happens not in another poſture.

One of the ſureſt of all the *Diagnoſtick* ſigns is the thruſting of the finger into the *Rectum* of Men. The Chirurgion will feel a hard body betwixt his finger and the *Pubis*, or a little higher. If the finger be not long enough, they make uſe of a hollow Probe called a Catheter, which is introduced through the *Urethra* into the Bladder; And then is felt ſomething that is hard making a dry ſound and noiſe as if one touched a Stone; this is the moſt certain of all *Diagnoſtick* ſigns.

It

It is very neceſſary to make an Experiment of this in dead Bodies, by opening the Bladder, and putting Stones therein; and then having ſtitched up the Parts, to introduce the *Catheter* by the Yard.

The *Catheters* that are made uſe of, to know if Women have the Stone, are of another Figure; they ſhall be repreſented with thoſe of the other Inſtruments,

When the Stone is skinned over by a peculiar *Membrane*, or when it is formed betwixt the *Membranes* of the Bladder, or that there be an old excreſcencie of fleſh, called a *Sarcoma*, (which are rare Diſtempers) or if there be a fungous Body, it is not eaſy to diſcern it, becauſe the Symptoms of theſe Diſeaſes in thoſe Parts are much alike; but the Stone is much more frequent there, and one is not often miſtaken, provided he be attentive in ſounding or ſearching.

What we have ſaid of the external Cauſes of the Shapes and Figures, ſerves us for Signs to foretell the plurality of Stones on which we ſee the markes of Colliſion, when during the time of the

Cure, a Stone is taken out which was not left in the Bladder, it is ſaid that Patient hath a Quarry of Stones.

The figure and bigneſs of the Stone being conſidered after the Operation, one may judge whither or no the conſequences will be dangerous, for if it be monſtrous, the parts have been much dilated and contuſed, and if it be craggy and pointed, there hath been dilaceration or adherence, and ſome times complication, the Stones that have many aſperities are never ſo big as thoſe that are even and ſmooth in their ſurface, and that for two reaſons; the firſt is, becauſe the minute Bodies that compoſe thoſe rough Stones, are not ſo cloſely comparted, and ſome of them may break off and be voided with the Urine; the ſecond, becauſe thoſe aſperities cauſe a more ſudden and pungent pain than other Figures, and force the Patient to betake himſelf more ſpeedily to the Chirurgeon for eaſe, who performs the operation, before that it hath had time to encreaſe to a greater bigneſs.

CHAP.

CHAP. VIII.

What is to be observed by the Chirurgeon before the Operation.

Hipocrates having taken an Oath never to undertake the cutting of the Stone; hath instructed us how necessary it is to observe all circumspection in performing it. Wherefore when a Chirurgeon pretends to the cutting of the Stone, he ought to frame to himself a Notion or Idea of opening to himself a passage to the Bladder through a convenient place for extracting of the Stone; by his Rules and Precepts he will know if he can Operate, and then he is to resolve upon it. He that is troubled with the Stone, is his Subject matter, and it is the duty of a skilful Chirurgeon to foresee the consequences, to the end he may guard himself with necessary remedies against the accidents of the matter, and of the Operation.

A Chirurgeon that is called to search or cut a Patient, ought to make him-

ſelf be diſtinguiſhed from Quacks; this will be eaſie for him to doe, if he obſerve what is taught in the Principles of Chirurgie, where they treat of the Qualities of the Chirurgeon and of the Servants.

It is one of his chiefeſt qualities to have great skill in Anatomy, that he may know the formation and ſcituation of the Parts, that ſo he may Operate with neceſſary circumſpection, being bold but yet not raſh: he ought to make his prudence appear by making his prognoſtick, and diſtinguiſhing between thoſe things that are ineffectual and perilous, and thoſe things, wherein according to the Rules of his Art he may ſucceed, without exaggerating the leaſt circumſtances and events that depend not upon him, by an unneceſſary flood of words.

He is to conſider the State, Strength and Age of the Petient; for knowing that a Man is upon the brink of death, before that he ſearch or probe him, he is to acquaint thoſe that are by, that it is no diſgrace to him if he cannot ſearch him, or if though the *Catheter* be even intro-

introduced into his Bladder if he make but little or no Water, by reaſon of his weakneſs; becauſe a Patient falls ſometimes into an apparent ſuppreſſion when he hath no Urine to render: this happened to me about 3 Years ago. I was ſent for to ſearch Mr. *Sartorin* an advocate, he was very Ancient, Hydropical, and at the very point of Death, and had not made Water for three days: I did not ſearch him, and he died within an hour after I ſaw him: when he was open'd there was not one drop of Water found in his Bladder; his Ureters were ſo cloſed up that the Urine would not paſs.

The Chirurgeon ought to be Informed from the Patients own mouth, and by thoſe that wait on him, of the ſecret matters and diſtempers to which he is ſubject; of the exceſſes that may have contributed to his Indiſpoſition, nothing is to be concealed from him becauſe of the Remedies and Inſtruments which he is to chooſe.

Hypocrates in the ſixth Aphoriſm of his ſixth Book affirms that old Men are

hardly cured of the Diſeaſes of the Kidneys and Bladder; and elſewhere he aſſures us that he never ſaw any paſt fifty years of Age Cured; becauſe according to *Cælius Aurelianus*, their Bladder is Nervous, and they have but little natural heat; beſides it is ſeated too high, ſo that Medicines cannot be conveighed to it. They are weak, and many Excrements fall continually that way. Nevertheleſs ſeveral have been cut and cured of the Stone at a greater Age.

It is a good preſage for the Cure, after the operation is performed, if the Patient ſleep, if his reſpiration is equal, his tongue moiſt, and if he be not dry nor do vomit; the lower region of the belly little or not at all ſwelled, with moderate pain and a ſlight Feaver; becauſe in that diſpoſition, (according to *Celſus*) the imflammation ceaſes moſt commonly about the fifth or ſeventh day.

He ought to know that the Patient oftner dies by the accidents that accompanie or follow the Operation, than by

by the Stones whilſt they are in the Bladder.

If the Patient be too weak, he ought to have time to gather ſtrength, otherways the Operation would reduce him to evident danger, and the Chirurgion ought to give notice of it, that he may avoid the blame: before the Operation ſome time is to be allowed for the digeſtion of the food that the Patient hath taken, that ſo his Body may be in better plight to endure it.

Celſus obſerves that moſt of learned men have a weak ſtomack, and that they are not ſtrong by reaſon of Watchings and over Studying.

The Medicines of *Pharmarie* cannot cure the Stone; they only bring relief when the Stones are very ſmall in the Kidneys or Bladder, and when they are as yet but a kind of matter eaſy to be reſolved into Powder, and to be evacuated with the Urine. The Chirurgeon ought to make his prognoſtick, examining, if he can, the bigneſs of the Stone, with his finger thruſt into the Fundament; informing himſelf,

how long the Patient has complained of it, obſerving the ſeaſon, place, and other circumſtances directed by the Principles of Chirurgerie.

Thoſe that have the Jaundice, or Dropſie, are not ſtrong enough to endure the Operation.

When one hath diſcovered the ſigns of the Stone or Gravel, if the Urine after it hath been bloody, or becomes full of purulent matter, it is a ſign that there is an Ulcer in the Kidneys or Bladder, cauſed hy the roughneſs and aſperities of the Stone, and that there is no hopes of curing an Ulcer in the Kidneys, becauſe hot and penetrating Medcines are required for expulſion of the Stones, and the contrary for Ulcers: nature ſometimes ſtirred up or aſſiſted by diverting Medicines, diſcharges it ſelf of that load, and gives opportunity of eaſing the Patients of their tormenting pains.

The Chirurgion ought not to expect a Cure, if after the Patient has been cut, the Nephritick Colick continue long, with pains that are ſometimes heavy and dull, and ſometimes acute and ſharp; becauſe

eauſe that is a Sign that there is a big Stone, or many little ones, which ſtill remain and take growth in the Kidneys.

A Patient labouring under a ſuppreſſion of Urine, cannot be cured after the third day, if he be taken with a drowzie fit, and if he can hardly fetch breath. The Hicket is a mortal ſymptom.

The Gout happening to thoſe who are troubled with the Stone, may ſometimes cure them; the contrary alſo, through the abundance of humors does alſo happen.

When the Stone is Adherent, or covered with a Coat, or if we meet with a fungous or ſarcomatick Body, the ſeparation of them is gradually to be attempted by injection and moderately deterſive Medicines.

Children are ſooner and more eaſily cured by this Operation, becauſe they have a more ſedate Mind, and leſs troubled with Paſſions, being nearer the ſource of Life, than thoſe that are ſtrucken in Age.

Whilſt all things are preparing, it is the Chirurgions part to comfort the Patient,

tient, ordering likewiſe that he have Spiritual and Ghoſtly helps Adminiſtred unto him.

CHAP. IX.

Of the Method of Searching.

WOmen are leaſt troubled with the Stone, becauſe their *Urethra* is ſhorter, wider, and more direct; and therefore is not ſo obnoxious to Diſeaſes as that of a Man: but ſeeing all ſorts of Perſons are ſubject to the Stone: having firſt inquired into the Signs, the Patient is to be put in a convenient poſture to be ſearched, that ſo the cauſes of their Pains may be diſcovered. If it be a Woman, ſhe is to be laid upon her Back, her Buttocks a little raiſed, and having choſen a *Catheter*, bending onely at the end, and anointed with Salade-Oyl, or ſome other ſweet Oyl, ſhe is to be made to open her Thighs a little. Then the Operator is to open and ſeperate the *Nymphæ*, with two Fingers of the ſame

ſame Hand, that the Orifice of the *Urethra* may appear beneath the *Clitoris*; afterward the *Catheter* is to be thruſt in gently with the other Hand, and ſo a ſearch to be made whether there be any Stone or not.

It is no great matter whether the bended part of the *Catheter* be turned towards the *Pubis*, or the *Vagina*, becauſe of the conformation of the *Urethra*, and it is convenient not to be juſt oppoſite to the hollow of the *Catheter*; for fear of the Eruption of Urine.

For the more eaſie ſearching of Men, they ought to lean a little back, or to be laid upon their Backs; and the Chirurgion having made them open their Thighs, he is to raiſe the Yard, and hold it ſtreight betwixt the Thumb, and the fore and middle Fingers of the ſame Hand, Skinning and taking the Prepuce off of the *Glans*, afterward with the other Hand he ſhall gently thruſt an oyled *Catheter* to the very bottom of the *Urethra*, holding it by the end where the rings are, like a Pen betwixt his Fingers, with this difference, that the rings

rings of the *Catheter* are to be hid with the ſame Fingers, his Hand being half open, turned toward the *Pubis*, and the bending or bill of the *Catheter* towards the *Anus*; then muſt the *Catheter* and Yard be moved towards the Groyn that is remoteſt from him that ſearches, and in the mean time he is to turn betwixt his Fingers the *Catheter*, and the bill of it towards the *Pubis*. Obſerve that the fore and middle Fingers touch the *Catheter* on the one ſide, and the Thumb on the other, anſwering exactly to the ſpace betwixt the Fingers; at the ſame time the Chirurgion is to preſs a little more with the fore Finger, which is higher than the middle Finger, ſo that the Center of the motion be upon the Thumb; by that means the handle of the *Catheter* is covered, and the bill or bending of the *Catheter* raiſed, that it may preſs the *Sphincter*, and enter into the Bladder; this is the Figure of it.

Whilſt the Chirurgion is turning the bill of the *Catheter* towards the *Pubis*, he is to pull the Yard a little up, that the *Urethra* may be extended and free from

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from wrinckles; becauſe it being a *Membranous* Part, the Plicatures thereof may hinder the *Catheter* from ſlipping down.

Sometimes, when the *Catheter* is introduced to the very bottom of the *Urethra*, and when the bill of it is turned towards the *Pubis*, the Chirurgion is obliged to let go the Yard, and to put a Finger into the *Anus*, and by a light compreſſion of the *Rectum*, and the *Urethra*, the *Catheter* is conducted into the Bladder; which being done, he is to draw out his Finger, and hold the Yard no longer.

The *Wire* or *Stilet* is taken out of the *Catheter* before it be introduced, and when it is in the Bladder, it is held by the rings betwixt the fore and middle Fingers, having the Thumb upon the hollow of the *Catheter*, and the back of the Hand turned towards the Patients Belly: then the Chirurgion is to give ſome eaſie Jogs, moving the bill a little to the right and left, without turning the *Catheter* fully round. The rings are lowred, that the bending may mount towards the bottom of the Bladder, and

ſome-

ſometimes they are inclined near the Belly, without forcing the *Catheter* out of the *Sphincter*, and by theſe kinds of motion, if one be very attentive, when it is a Stone, one ſhall hear a little ſound as of two ſmall Stones that touch one another, or at leaſt ſomething is to be felt that makes a colliſion with the *Catheter*, as if it were rubbed with a Stone, if it float, it may be felt when there is Urine in the Bladder; And that requires that the Operator ſhould ſtop the hollow of the *Catheter* with his Thumb; but if nothing be felt, the Urine is to be let out by the *Catheter*, and then diligent ſearch to be made.

There is another way of ſearching Men; the Yard is to be raiſed and moderately pulled up, laid upon the Groyn, and the rings of the *Catheter* inclined towards the Belly; ſo that the bill be turned towards the *Anus*.

There are Ungoſities in the Bladder that ſometimes deceives him that ſearches; but they may be diſcerned, becauſe then, one finds onely ſomething that is ſoft or but moderately hard, which makes

no noiſe by the touch of the *Catheter*, the Bladders of Children have no Ungoſities like to thoſe of Men.

In the Hoſpital of the *Charity* at *Paris*, about the beginning of a cutting in the year, 1681. Two Children were preſented to be cut; but the Stone not being felt, they were put to Bed again; notwithſtanding, after many others had been cut, they were examined the ſecond time, the Stones diſcovered, and immediatly cut out, becauſe they were prepared. This makes it appear that one ſhould not be too haſty to give his Opinion, if ſometimes the Stones are not felt though the Signs ſeem evident, becauſe they may be ſmall or change their place. At the ſame time a Man was ſearched with a *Catheter*, uſed to make Patients void Urine. After that the bill had been inclined to the right ſide, and ſeveral times thruſt towards the bottom of the Bladder, the rings were preſſed down towards the Belly, as if there had been a deſign to bring out the *Catheter*; but when the bill of it was judged to be near the *Sphincter* of the Bladder, it was turned

turned to the left ſide, which could not have been done ſooner, becauſe of the length of the bending of that *Catheter*, and the ſmalneſs of the Bladder; the Operator continued to ſearch the Stone, which not being felt, was found with another *Catheter*, whoſe bill from the beginning of the bending, was not ſo long, and therefore that *Catheter* turned eaſily in the Bladder.

This obſervation inſtructs us what *Catheters* are to be choſen for voiding of Urine, whoſe bill ought not to be ſo long as thoſe that ſerve for making of the inciſion, and which are Channelled or Furrowed. There are ſome Men who have very narrow *Urethra's*, which require ſmall *Catheters* like thoſe for Children, and of a ſufficient length. *Catheters* that do not eaſily bend or bow, are likewiſe to be choſen; and that depends on the Work of the Artiſt that makes them.

When the Stone is in the Neck of the Bladder, it is not neceſſary that the *Catheter* ſhould be introduced ſo far as the bottom of it, becauſe the Stone may be

felt,

felt, provided the *Catheter* be onely introduced as far as the bottom of the *Urethra*.

When there is a Carnosity, which hinders the *Catheter* to slide into the Bladder, the Operator must put a finger into the *rectum*, and if there be a Stone he will find a hard and ponderous Body towards the *Pubis*, if there be a great inflammation, it is the opinion of *Fernelius*, that no search should be made; in that case one should observe to search gently and seldome, because otherways it may be the cause of pain, inflammation, excoriation, a gangreuous Ulcer in the *Sphincter*, nay and even a Supression of Urine, or a peircing of the *Urethra*.

Besides these Diseases, one cannot sometimes search because of a *Phymosis*, and of a Stone in the *Urethra*; something must be said as to that, as much as is necessary to be known upon the account of *Lithotomy*.

CHAP. X.

Of a Phymosis, *and of the Stone in the* Urethra.

MAny Children have a *Phymosis*; to ſearch them, we muſt hold the Yard betwixt the little finger and the ring finger, the back of the hand being towards the Belly, and with the other fingers pull back the *Prepuce*, as if one intended to skin the *Glans*, the thumb on one ſide, and the fore-finger and middle-finger on the other, gentlely preſſing with theſe three fingers towards that part of the Nut or *Balanus*, where one Judges the end of the *Glans* to be ſeated, that by that means the Orifice of the *Urethra* may be the more dilated; then the *Catheter* is to be entroduced gently, ſearching for the perforation of the *Glans*; one may know that he is in the *Urethra*, if the *Catheter* enter eaſily, and by feeling with the fingers of the other hand along the *Urethra* on the under ſide of the Yard.

If

If the *Prepuce* be ſo ſtrait that the *Catheter* cannot be introduced, or if one cannot hit upon the Orifice of the *Urethra*, there is no danger, to dilate a little the *Prepuce* ſideways, with the point of a common *Biſtori* or a pair of ſharp Ciſſars.

Obſerve that before the introducing of the *Catheter*, it will be fit to ſqueeze the yard with the fingers along the *Urethra*, and ſo to try if one do not feel ſome hard Body which ſtops the paſſage, as Carnoſities or Stones. When it is a Stone the *Catheter* is to be drawn out; and if before ſearching it was known to be a Stone, and that it ſtuck in the middle of the Yard between the *Glans* and the *Teſticles*, there is no ſearching, but having onely preſſed the Yard with the fingers from the *Pubis* to the Stone, the Operator ſhall take a *Curette* or *Extractor* oyled, and having introduced it by little and little, and paſſed it beyond the Stone, he may therewith draw it out of the *Urethra*.

The *Curette* or *Extractor* is like an ear-picker, made of Steele, becauſe it is leſs

apt to bend than if it were made of another Metal, the Operator must have of them of several sizes in bigness, four or five inches long; the figure of it you may see in the lower end of the second plate of Instrments.

The extremitiy of the *Urethra* may be dilated in the upper part of the *Glans*, when stones are extracted with the *Curette*, and when being brought as far as the Orifice, they cannot pass without pain.

The Urine serves for a Remedy; and if there hath been a Contusion and Pain, it is enough to foment the Yard with the oyl of Roses, and cover the Nut or *Balanus* with a little pledget dipped in the liniment of *Arcæus*, dissolved with a little *mel rasatum* moderately expressed out with the *Nucial* or Cross bandage open in the middle, and the band with three heads to wrap it up in, and it is not to be forgot, if there be need for it, to put a girdle about the Child, to which the band may be tied, nay and a Collar hanging about the neck like a Chairmans Strap, the lower part of which is to be fastned to the girdles that it may

not

not ſink lower than one would have it.

That Bandage ſerves for other Diſtempers of the Yard, begininng to apply it upon the *Glans*, and then bringing it nearer to the Belly, with ſlight roulings and circumvolutions to keep the Medicine faſt to the part, and near to the *Pubis* an indifferent hard knot is to be maſt, then the two heads at the other extremitie of the Band or Truſs are to be tied to the girdle.

The preciſe length and breadth of all the parts of that bandage cannot be determined, becauſe it depends upon the judgment of the Chirurgeon to make them ſo long and ſo narrow as that they be not Cumberſome.

There is ſtill another way of extracting the Stone out of the Yard, when it is at a diſtance from the Sphincter of the Bladder. And that is this; having drawn back the skin of the *Præpuce* as much as one can towards the Nut of the Yard, a Ligature is made betwixt the Stone and the *Pubis*; or otherways one may with the fingers compreſs the Yard and the skin be fore and behind the place where

apt to bend than if it were made of another Metal, the Operator must have of them of several sizes in bigness, four or five inches long; the figure of it you may see in the lower end of the second plate of Instrments.

The extremitiy of the *Urethra* may be dilated in the upper part of the *Glans*, when stones are extracted with the *Curette*, and when being brought as far as the Orifice, they cannot pass without pain.

The Urine serves for a Remedy; and if there hath been a Contusion and Pain, it is enough to foment the Yard with the oyl of Roses, and cover the Nut or *Balanus* with a little pledget dipped in the liniment of *Arceus*, dissolved with a little *mel rasatum* moderately expressed out with the *Nucial* or Cross bandage open in the middle, and the band with three heads to wrap it up in, and it is not to be forgot, if there be need for it, to put a girdle about the Child, to which the band may be tied, nay and a Collar hanging about the neck like a Chairmans Strap, the lower part of which is to be fastned to the girdles that it may

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the Stone is obſerved to ſtick, and afterward make Inciſion upon the Stone a little ſide-ways in the *Urethra*, that ſo the Stone may be taken out by means of the *Curette* or Extractor, introduced into the Orifice of the Inciſion, the Ligature being removed and the Skin loſened, the Inciſion ſtops and is cured by the Balſom of the Urine; without other Medicine.

If one be unwilling to make Inciſion in the *Urethra*, or if the Stone cannot be got out with the Extractor, it will be fit to give *Diuretick* Medicins to force it forwards to the *Glans* thereby to facilitate its Extraction.

CHAP. XI.

Of the time of Searching and Cutting; of the Inſtruments; of the patients Diet; and of the firſt Preparation.

A Patient may at any time be ſearched or probed to make him render his Water, and to diſcover the Diſeaſe; if

if one find himſelf extreamly troubled with the Stone, cutting is not to be delayed without danger; but ſince ſome diſeaſes requires a ſpeedy Operation, we ſhall not ſpeak of the time which is called the time of neceſſity; but onely of that of Election, which is laid hold of, when the diſtemper is in ſuch a Conditionas to give opportunity to do things in order and without precipitation.

The Spring is the moſt temperate ſeaſon of the Year; wherein *Vitriol* the father of all Productions, gives verdure to Plants, and contributes to the vigour and ſtrength which men find renewing in themſelves at that time, then do men undertake what was interrupted by the exceſſive cold or heat of other ſeaſons, that in the *Atumne* they may enjoy the fruit of their paſt labours. With great reaſon then men chooſe the Spring time for many Operations, and amongſt others for *Lithotomy*. In this Conutry we muſt expect till the impreſſion of the Winter cold, and the frequent Rains be over. Though the Spring begins on the eleaventh of *March*, nevertheleſs accord-

ing to the temper of the Air, the Operation of the Stone is accelerated or retarded; but commonly it is performed in the Month of *May*, Next to the Spring, the *Autumne* is to be preferred before the other seasons.

Though Liquors and *Menstruums* for dissolving of Stones were in use, yet must we of necessity speak of the Remedies of Chirurgery, which are Instruments of Iron or other Metalls proper for *Lithotomy*. Take here their figures and the names of their parts.

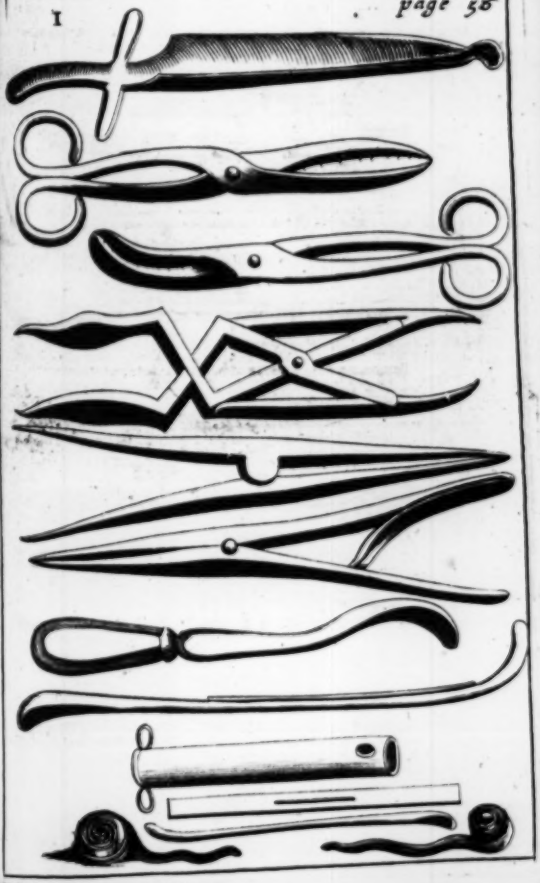
1. A Rasor to shave off the hair from the privy parts.

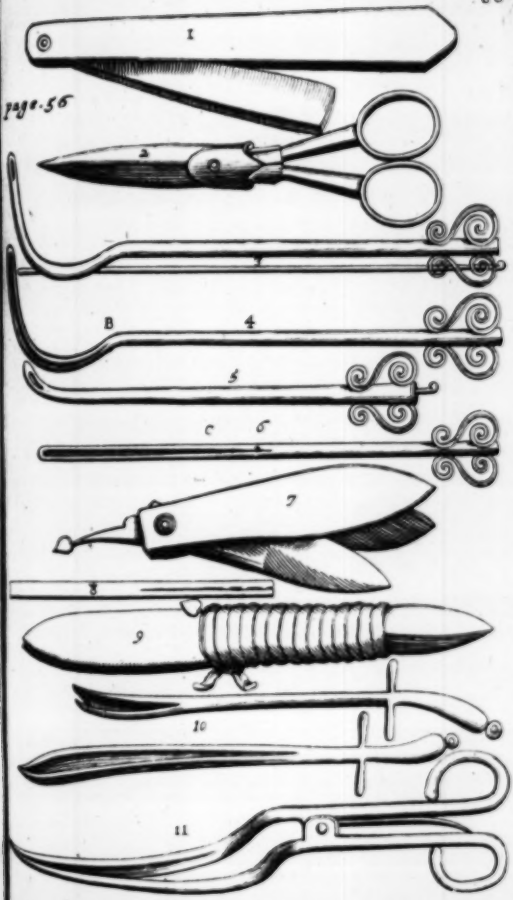
2. Common Cizars for ordinary Incisions.

3. A Hollow sound or probe, called a *Catheter*, for searching of men, and making them render their Water, and its *Stilet* or Wire to cleanse it.

4. A *Catheter* or *Stafie* for making Incision in men, furrowed in the back from A. which is the bill or *bec*, to the place marked B. without any cavity in its length.

5. A Hollow *Catheter* and onely crooked

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crooked at the bill for ſearching of Women, and its Wire for cleanſing it.

6. A Streight *Catheter* or *Staffe* and hollowed or furrowed from the bill to the place marked C. which is ſometimes made uſe of for making Inciſion at the Orifice of the *Urethra* of Women. It is requiſite to have always in the *Catheter* caſe a part, a little piece of a Spunge moderately moiſtened with Salad-Oyle, becauſe ſometimes it may be wanting when there is need of it to anoint the *Catheters*.

7. A *Biſtori* that opens like a Lancet with a point and edge like the ſame onely the point blunter, at the head whereof there is a flat tayle to keep it firm againſt the handle when it is opened,

8. A *Languette* or roller to mount the *Biſtori*, it is ſlit at the end, a finger broad, and a foot and half long.

9. A *Biſtori* mounted, that is to ſay, armed with the *Languette* or Roller.

10. Conductors or Probes, whereof a pair ſerves for the Operation, that which is next to the *Biſtori* mounted is forked, and the other has a line in the length

length of its cavity, for guiding and conducting the former. Nevertheleſs that alone which is remoteſt from the *Biſtori* may be uſed for conducting the forceps or *tenette*.

11. Another kind of Conductor compoſed of the two above deſcribed; it turns with an elbow about the midle, and has a Spring betwixt the branches near the rings; it was invented by *Joſeph Covellart*.

1. Another kind of Conductor called in French a *Gorgeret* more commodious and more in uſe. It is hollow tapers and grows narrower at the end, where there is a bill that is introduced into the furrowing of the *Catheter*, whilſt it is held by the other end ſhaped like a T. There are ſome who doe not approve of this Conductor, ſaying that it dilates the parts too much, and that it occaſions Fiſtula's, but without ground, for it is narrower than the forceps which is drawen out with the Stone and poſſeſſes more room, and the Fiſtula is onely occaſioned by the conſequences of the Operation, as ſhall be explained in its proper Place.

2. Streight

2. Sreight and crooked *Forcipes* or *Tenettes*. A. their Teeth, B. their Branches, C. their Rings.

3. A *Dilatatory* for Men. It is named a Compound or great *Dilatatory*. D. the bill or *bec* of the *Dilatatory*. E. the handle.

4. A ſimple *Dilatatory* for Women. The extremities of it are blunt, and very ſmall, the Branches are joyned in ſuch a manner that cloſing the one end, the other opens. It repreſents the letter X.

5. Another *Dilatatory* that may ſerve for Women and little Boys. It hath a ſpring near the handle, and can dilate but moderatly. It may be uſed when one fears that ſome *Fibres* have been left in time of the Inciſion.

6. A Hook or *Crochet* to pull out the Stones that are in the Paſſage, either in the leſſer Operation or otherways, ſome cauſe them to be made with little Teeth in the cavity of its bending; but there is no neceſſity for it.

7. A Button, a Scoope. About ten Inches long, and as big as a quill. F. the part properly called the Button. G. the body

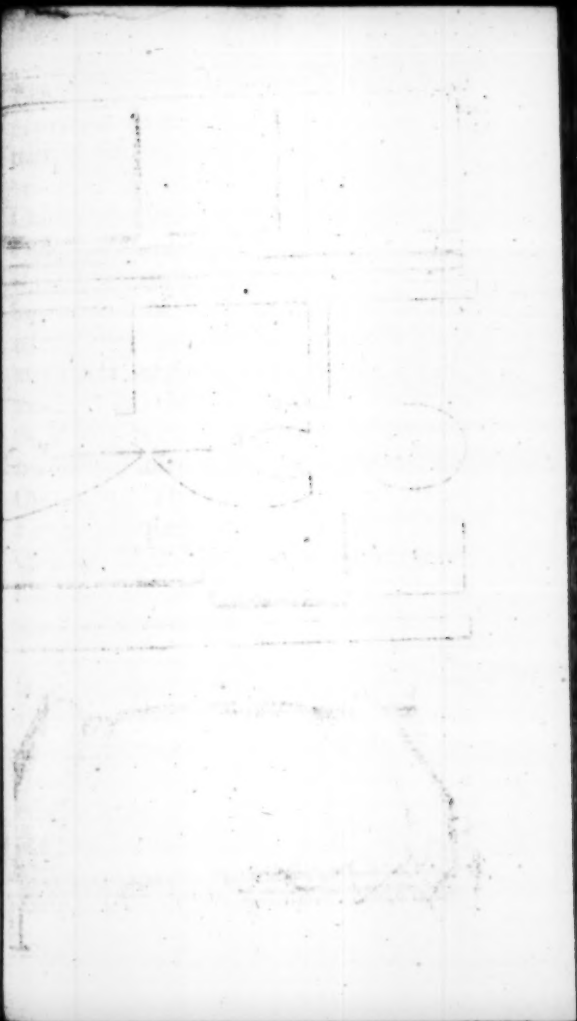
body of the Button, H. the other end which is hollow, called the *Curette* or Scoop of the Button. I. a ſlight line to conduct the Forceps.

8. A hollow Tent, Pipe or *Canula*, having rings at one end called the Head, the other end is called the Point, where there are two holes called the eyes of the Tent.

9. A *Languette* or Fillet for mounting the hollow Tent, introducing it into the Slit, and putting the two ends of the Fillet through the rings of the Tent, then it is called a Tent mounted. That Fillet or *Languette* is to be two foot long, and a finger broad.

10. Two Ligatures by the *French*, called Scarffs for perſons grown up; they are made of ſilk and wooll mixed together, each of them is four or five ells long, and four or five fingers broad. If the Chirurgeon want Ligatures or Scarffs; when he is making his Preparation, he may cut bands of ſtrong linnen-cloath, and make uſe of them. There is nothing loſt in that, for he may afterward cut them to ſerve for a Truſs or

Froude,



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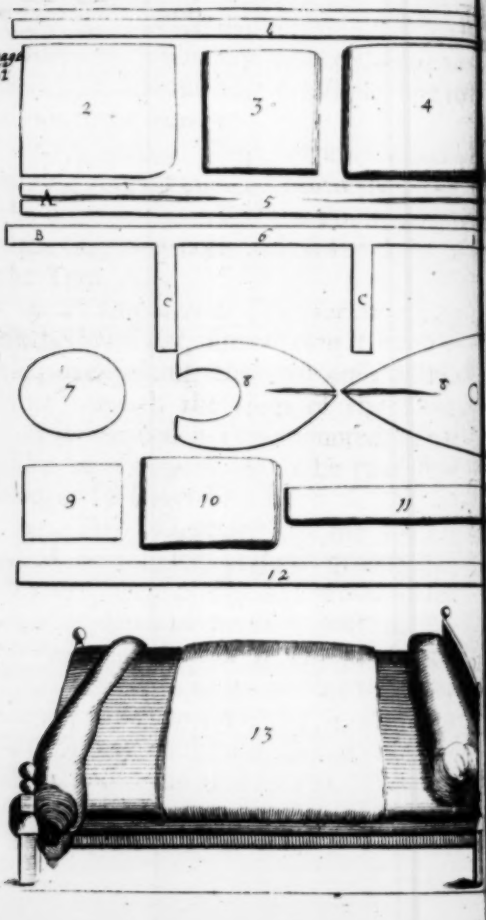

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Froude, and for dreſſing the Patient.

11. An Extractor or *Curette* for extracting Stones out of the Yard.

1. A Chair uſed in the Hoſpital of the Charity at *Paris*, on which the Patient is ſet, for the more commodious performing of the Operation. There are behind two bars or rods of Iron in form of Butteresſes; they are hooked, that ſo they may enter into the rings of the Chair, and ſharp at the end to ſtick firmer in the Floor, becauſe the Patient ſtruggles and uſes violence in the time of the Operation. The Chair ſhould be placed a little obliquely for the light to come upon the right hand of the Chirurgeon, that he may ſee the better when he is about his Operation.

Inſtead of that Chair, the Patient may be ſeated upon the ſide of a Bed, or on a Table, with a Mattreſs or Quilt, whereof one part covers the back of a common Chair reverſed, about half a foot diſtant from the edge of a Table, in a ſloaping manner. That Chair is to be made faſt with many ſtrong cords, if there be no Matteresſ or Quilt, it will

be

be ſufficient to lay a Pillow or any other thing to make the place ſoft, and a folded Sheet over it.

2. A Sheet folded length-ways with many folds, to cover the Chair that hath been deſcribed, or the Matteress in the time of Operation: one part of it is before, and the reſt hangs behind.

3. A Budget to put in ſeparatly the ſtreight Forcipes in the one ſide, and the crooked, with the hook in the other, in the bottom the *Dilatatory*, the Button and the Conductor are hid. It may be ſhut, lifting up the ſides of it when there are Button-holes, into which are put the Buttons that are faſtened to the places marked C. D. near the ſtrings.

A Table whereon the Porringer with Oyl is ſet, and the mounted Biſtoris laid, under which a peice of linnen-cloath folded with many plaits, is put croſs-ways, that their points may not touch any thing. It is fit that ſeveral Biſtoris ſhould be mounted, though there be but one Operation to be made, becauſe the edge or the point are ſometimes blunted, and it is neceſſary to have ſome

rag

rags of linnen-cloath and napkins in readineſs.

All the Inſtruments may be made of Steel or Iron, nevertheleſs the *Catheters*, Conductors, Button and Tents, are neater when they are of Silver, and leſs ſubject to ruſt. Of each kind there ought to be ſeveral ſizes, and thoſe well poliſhed.

It is not enough to have ſpoken of the Inſtruments of Chirurgie, we muſt likewiſe, according to the Rules of good method, take into conſideration, what things are neceſſary before, in the time, and after the Operation. Before the Operation the Patient ought to be prepared for ſome days by a Diet, Bloodletting, Glyſters, Purges, reiterated more or leſs, according to the advice of a skilful Phyſitian; and the night before the Operation, the Patient muſt take a laxative, or elſe an aſtringent Glyſter, according as need ſhall require. He muſt have 2 days time at leaſt to reſt in after he hath taken Phyſick: and ſpiritual Remidies are not to be omitted.

At the time of cutting, the Operator muſt

muſt chooſe four faithful ſervants at leaſt, a Chamber indifferently warm, and in a good Air where the light of day may ſuffice. He muſt have an Apron and Sleeves, and under the Table a tub of warm water to waſh the Inſtruments; upon the Table there muſt be Salad-oyl or oyl of Roſes, and there he is to lay his Inſtruments in order for the Operation: all theſe things are called the preparatives. (*Appareil*) for the Operation: the Bandage and Medicines that are made uſe of to dreſs the Patient that is cut, are called the preparatives for the dreſſing, which ought to be in readineſs, becauſe they are uſed immediatly after the Operation.

The Medicines, both Powders and Oyntments ought to be aſtringent, warm, *Oxycrat* and *Oxyrodinum*.

The Bandages as well for Men as Women. are

1. The Ligature, or *Colier*, which is a great band for Blood-letting, when the two ends of it are tied together, it is of an oval Figure, which is put over the Head, and comes down as far as the Navil.

vil. This band may be put about the Patient before the Operation.

2. A Bolſter or compreſs of a moderate thickneſs, three or four fingers broad, to put upon the wound when the Operation is done, and when the Patient is to be carried to bed; it ought to be laid upon the Table, with the Biſtories and the *Catheters*.

3. An aſtringent Plaſter of a ſufficient bigneſs to cover the Belly.

4. A *Ventriere* or Belly-clout, which is a great Bolſter or Compreſs to cover the Belly, it is to be dipped in warm *Oxycrat*.

5. The *Froude* or Bandage or Truſſe with four Heads, A. the Heads which may be called Twins, becauſe they begin in the ſame place, and are deſtined for one and the ſame uſe.

6. The Truſs or double T. or ſecond Truſſe, B. B. the girdle of the Truſs, C. C. the Tailes or Straps of the Truſs.

7. A Pledget *Plumacean* covered with Aſtringent.

8. Aſtringent-Plaſters of ſeveral ſizes.

9. A Plaiſter longer than broad, to

be put ſome days after the Operation upon the Pledget inſtead of the former Plaſters, this Plaſter ought to be ſomewhat longer than the Wound.

10. A ſmall ſquare Bolſter or Compreſs indifferently thick, and ſomewhat larger than the Plaſter above deſcribed.

11. Another double compreſs an Inch broad and a Foot long for Males, called a Truſs. Theſe two Bolſters are to be moiſtened in war m *Oxycrat*.

12. A Ligature or *Farettiere*, which is a long band to be Swathed about the Thighs, that the Patient may keep them within a moderat nearneſs to one another.

13. A Bed covered with a Rowling-Sheet, or a Sheet doubled into many folds, and laid croſs the Bed, in the place where the Kidneys and Thighs of him that is cut do Reſt. There is need of ſeveral Sheets or *Alaiſes* to ſhift and make it dry when it is wet, it is to be warmed with a Warming-Pan; if it be needful, it is requiſite alſo to have a good many Napkins in Readineſs to put under the Patient, when he hath a Looſeneſs that he may

may be the ſooner laid dry, and ſometimes beſides that *Sheet* a Sere-Cloath or thin Blanket is put betwxit the Sheets & the Quilt to preſerve it from ſpoiling and rotting by the Urines; but a Sere-Cloath makes the Bed too hard, and is not good but when there is a want of Sheets or a Quilt to ſhift the Patient. It is not to be forgot that a cord muſt be faſtned to the top of the Bed or ſome other place to help the Patient to raiſe himſelf.

There are ſome Operators that hide their Inſtruments in their pockets, or put the *Catheters* in their Button-Holes before they anoint them with Oyle; others lay them in a Diſh, nevertheleſs ſeeing it makes a noiſe when the Operator takes them up to Operate with, it ſeemes more commodious to have them in a Pouch or Budget.

CHAP. XII.

Of the Posture and Scituation into which Children are to be put; when they are to be Cut.

ALL things being prepared, the *Catheters* put into Oyle, the *Bistouri* and Tents mounted, and laid upon the Table, the Tub with warm water underneath it, the streight and crooked Forcipes with the hook placed in order in the fore part of the Budget, a Conductor, the Button and Scoop, and a Dilatatory, if it be thought necessary in the bottom of the Pouch or Budget: the Patient is sent for, brought to the place of Operation, and set upon the Chair standing a little obliquely, that the light from the Windows may dart upon the right side of the Operator, who is to keep his Instruments from the sight of the Patient.

If it be a Child of four, five, seven, ten or twelve years of Age, two Servants may hold him by the Hand and Feet

Feet on each ſide, whilſt another getting up upon ſomething behind the Chair, and looking forwards, may commodiouſly lean upon the Patients ſhoulders, placing the Thumb of both Hands towards his Back, and the other Fingers upon the Clavicles, for the ſurer hold, the Servant who is on the right ſide of the Patient, ought to put his left Hand betwixt the Patients Thighs, and take faſt hold on his right Hand wriſt, and that the Child be not hurt, the ſleeve of his Shirt may be pulled down to cover his Hand; after that the ſame ſervant with his Right-Hand ſhall lay hold of the Leg on the ſame ſide by the Foot and Anckle. The Servant on the Patients Left-Hand ſhall do the ſame, taking hold of the Left-Arme with the Right-Hand, and with the Left-Hand of the Left-Leg near to the Foot,

In this poſture the Childs Hands muſt almoſt touch his Heeles, and if he but any way hold faſt, his Thighs ſpread, the *Lithotomiſt* has Room to Operate, and becauſe Children do extreamly Struggle and Strive, two other ſervants may like-

wiſe keep their knees a ſunder; but it is cheifly to be obſerved in this poſture, that the Patient lean half backwards according to the ſhape of the Chair, or for want of that, near the Beds ſide, or the Table, covered with a Quilt or Matteres, ſo that his Fundament may be ſeen, and that his Feet do not reſt upon any thing, ſo that he have leſs force to ſtir or move himſelf. Hear is the Figure of it.

There are ſome Operators who chooſe a ſtrong Man, and make him ſit upon a pretty high common Chair, or upon the end of a Bench, who having a Cuſhion againſt his Belly, and a Sheet over it, takes the Child, who is to be cut, upon his Knees joyned together, the Man having his Knees cloſe, puts his Hands betwixt the Childs Legs, and ſo takes hold of his two Wriſts; by this means the Child is put into a convenient poſture to be cut, take here the Figure of it.

Beſides the Man that holds, it is requiſite that ſome other perſons lean upon the Childs Shoulders, open his Knees, and keep his Feet ſteddy.

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Nevertheleſs, ſeeing the Operation is ſometimes laborious, and that the Man who holds may be weary, it is better to make uſe of the firſt way.

CHAP. XIII.

Of the different ways of Extracting the Stone, according to the Cuſtome of the Egyptians.

The Practice of the high Operation

SOmetimes the Chirurgion cannot introduce the furrowed *Catheter*, becauſe of pain or inflammation, occaſioned by too frequent ſearching before, or becauſe there may be fear of putting the Patient to too much pain, or that there may be a Carnoſitie or Calloſitie in the Part, or becauſe the Stone is in the *Perineum*, or in the Neek of the Bladder.

Theſe different diſpoſitions oblige the Operator to conſider how and in what manner the Operation is to be performed. The firſt which is not in uſe, is cal-

led the high Operation. The ſecond and third are daily practiſed, and are called the leſſer, and the great Operation.

We pretend not to comprehend the two Methods, mentionded by *Proſper Alpinus*, in the fourteenth Chapter, of his 3d. Book of the Medicine of the *Egyptians*, where he relates their Practiſe of extracting the Stone of the Bladder, without making Inciſion, but only by Dilatation of the *Urethra* by blowing into the Yard.

When I lived in *Egypt*, ſays he, a certain *Arabian* named *Haly*, in great Reputation for Extracting Stones without Inciſion, took out ſeveral in my preſence from *Horam Bey*, a Turkiſh Commander, in this manner he ſet about it; he made uſe of a wooden Pipe eight fingers long, and about the thickneſs of ones Thumb; having applied this to the paſſage of the Yard, he blew into it with great force; at the ſame time with the other hand he preſſed the extremity of the Privy Part towards the *Perineum*, to hinder the Wind from entring into the Bladder; then he ſtopt the mouth of the Pipe, to make the *Urethra* ſwell and

and ſtretch. This being done, a Servant put his Finger into the *Anus*, and brought the Stone by little and little towards the neck of the Bladder, and the beginning of the *Urethra*: and then the Operator perceiving that the Stone was near the *Perineum*, he ſuddainly and with force drew back the Pipe from the paſſage of the Yard, and ſo dextrouſly Extracted the Stone, which was about the bigneſs of an Olive-Stone. I was preſent at this Operation which he performed upon that Turkiſh Commander; and afterwards I ſaw him Practiſe it upon two Jews, one of which was a little Boy, from whom he took 8 ſmall Stones, and the other was grown up, from whom he took one as big as an Olive. This *Arabian* made uſe of the ſame Method to draw Stones out of the Bladder.

In the ſame Chapter he ſpeaks of a Letter written to him by *Octavius Poveretus*, a moſt learned Phyſitian in *Egypt*, for the Common-wealth of *Venice*.

Some Months agoe, ſays he, an *Arabian* of *Sidon*, a Chriſtian, Extracted a Stone without Inciſion from another Chri-

Christian named *Cophtus*, and it was done in this manner. The *Arabian* had many Pipes of different sizes, much of the shape of Flutes, or Pipes which are musical Instruments. They were made of a Cartiliginous matter, which would easily streatch: he introduced the smallest into the *Urethra*, and thrust it forward as far as the Bladder: immediatly thereupon, he blew in it with all his strength to make it swell; then he pulled out that Pipe, and put in a bigger, blowing in it after the same manner, and so continued charging the Pipes until he put in the fourth, which was the biggest; and when he thought by this means that he had dilated the passage sufficiently to make way for the Stone; he placed the Patient in a convenient posture, and put one Finger into the *Anus*, to bring it towards the neck of the Bladder where the end of that great Pipe was, into which he endeavoured to make the Stone enter. This being done, he put his mouth to the other end of the Pipe, and sucking with all his strength, he did what he could to draw the

the Stone towards him, which broke often when it was too big, as it hapned to this Man named *Cophtus*; for he fetched from him but a part of it, and the reſt being a big and large fragment could not be got out.

This way, ſaith *Kovoretus*, is eaſie to be learnt, and perhaps a skilful Chirurgion might have better Succeſs in the Practiſe of it, which is a thing to be deſired by thoſe who are troubled with the Stone. *Beverovicius* makes mention of thoſe two ways taken from *Proſper Alpinus*. But it is more pertinent in this place, without examining the circumſtances of thoſe two ways, to give the deſcriptions of thoſe which are called the high, the great, and leſſer Operation.

De Franco was the firſt that practiſed the high Operation, which is ſo called, becauſe it is performed in the *Hypogaſtre*, and though he does not adviſe the doing of it, yet if there were a neceſſity for it, it does not ſeem impracticable in this manner. Let the Patient be laid and held faſt upon a Matteres or Quilt, then let a Ser-

a Servant thruſt his fore-finger and midle finger one after another into the *Rectum*, to make the Stone riſe as high as one can; at the ſame time the Operator is to make Inciſion gently above the Groyn and on the ſide of the *Linea-alba* (the white line.) The Bottom of the Bladder may without doubt be opened withoutuhrting the Parts of the lower Belly, becauſe it is ſcituated between the Duplicature of the *Peritoneum*, and the fuller that it is of Urine, the more Apparent it will be: by means of the Urine the ſimple Dilatatory may be conducted, and then the button, which after the Dilatory is taken out, may ſerve for a Conductor to the Forceps. Mr. *Jonnot* told me, that Mr. *Bonnet* a Chirurgion who heretofore Practiſed *Lithotomie* in the *Hotel Dieu* of *Paris* aſſured him, that he had cut in that manner. Mr. *Petit* a Maſter Chirurgion of that Hoſpital told me that he had ſeen Mr. *Bonnet* Practiſe it upon a young Girl.

The Cure is to be performed as of ſimple Wounds in the lowor Belly, or otherways the Method may be changed according

according as Symptoms happen to follow. Experience teaches us that the Wounds of the Bladder are not allways Mortal.

If any one would Practice the High Operation, it would be necessary to try many Experiments on dead Bodyes, after the Water is taken out of the Bladder *De Franco* in the same place, Chap. XXXIII. Proposes another way of cutting, which is immediately after the Incision to put in a Tent, unless the Stone present it self at first, and some days after when the pain is ceased to pull out the Stone. But this way is onely Practised when the Operation is Laborious; and instead of a Tent, a Pipe is made use of.

CHAP. XIV.

The Practice of the lesser Operation for Men.

THE lesser Operation hath been so called because the Practice thereof requires but a few Instuments; it was invented by *Celsus*, and described in the seventh Book, twenty sixth Chapter, as

as it was heretofore Practiſed; but if the Stone be not towards the neck of the Bladder, and that it be felt in the *Perineum* near to and under the *Scrotum*, the manner of extracting it is different.

That I may give a clear Notion of the thing, I ſhall here Obſerve what happened in many *Lithotomies* in the Year one thouſand ſix hundred and eighty, in the Hoſpital of the Charity of *Paris*. Though I had my ſhare in thoſe Operations that were Laborious, yet I ſhall only mention one that happened to *Monſieur Jonnot*, the Circumſtances whereof agreed exactly with other Operations which I performed in his preſence: this Relation will give ground for making two kinds of leſſer Operation for men.

There was brought to him a Boy of ſeven Years of Age that had been cut the Year before. He needed not make uſe of the *Catheter* to aſſure him of the deſtemper, for with two fingers one might feel the Stone towards the midle of the *Perineum* above the former *Cicatrice*.

To hold it faſt, it was needleſs to put

put the fingers into the *Anus*, becauſe the Stone being too high it could not be compreſſed, as is uſually done, when it is in the neck of the Bladder; but having cauſed the *Scrotum* to be lifted up, and the Skin held ſtrait, *Monſieur Jonnot* turning the inſide of the left hand towards the Cods, he preſſed the Tumor with his Thumb and fore-finger on both ſides of the Suture where he had obſerved the Stone; at the ſame time he made the Inciſion on the ſide of the Suture upon the Tumor, and having opened a paſſage, with a midle ſized Hook, he extracted the Stone; afterwards feeling with one finger that there were others ſtill remaining, he was obliged to keep the place dilated with the ſame finger that introduced the Hook, and that the Stone might not ſhift its place, he held it faſt with the fore-finger of the Left-Hand put upon the upper part of the Wound, and with the Thumb on the lower part. By that means he happily finiſhed that Operation, that he might cut the ſame Patent by the great Operation; for having pulled out all the ſmall Stones and Fragments

ments that were in the *Perineum*, he introduced by the Yard a furrowed *Catheter* wherewith he found another Stone in the Bladder, and upon that *Catheter* he continued the Inciſion with the other Circumſtances whereof we ſhall ſpeak in the great Operation. I was neceſſitated to do the ſame to a young Man of twenty two Years of Age.

I remember that before Monſieur *Jonnot* made uſe of the *Catheter* to cut him by the great Operation, he introduced into the Yard a great ſtreight Wire or *Stilet* to force down ſome Fragments that ſtuck a little higher than the Inciſion, whilſt he compreſſed the *Urethra* underneath, and then putting his Thumb below the Wound, he drew them out with a ſmal Scoop without any trouble.

This ought to ſerve when one cutteth the Stone out of the *Perineum*, becauſe at the ſame time we muſt ſearch if there be none in the Bladder; and that it may be done with leſs pain and trouble, a *Catheter* that ſerves to make Women void their Urine may be introduced by

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by the wound. This I ſaw practiſed upon one who had contracted a Fiſtula upon cutting, and had a Stone in the Bladder, who endured the great Operation after that the *Catheter* was taken out.

It is not needful to make the Patient jump before he be cut by the leſſer Operation; if he be a little Boy, and the Stone in the Neck of the Bladder, it is enough, after that he is put into a poſture, and held faſt by the Servants, that the Chirurgion dip his fore-finger and middle-finger into Oyl, the nails being pared; and if one Finger be not ſuffiicient, that he thruſt them one after another into the Fundament, as far as poſſibly he can, that they may reach beyond the Stone, and preſs it down to the Neck of the Bladder, betwixt the *Rectum* and the *Os Pubis*, a Servant in the mean time lifting up the *Scrotum* with one hand, and with the other armed with a Compreſs leaning upon the Belly, to make the Stone come down; then the Chirurgion is to dry the *Perineum*, and ſtretch the Skin very ſtrait with his other Fingers, as it is repreſented in this Figure.

The Tumor that the Stone covered with Teguments makes, renders the Inciſion eaſie on the ſide of the Suture, which may be made long enough for extracting of the Stone; care nevertheleſs muſt be had, to avoid the *Rectum*, the *Hemmorhoid* Veins and the Cods. One muſt not fear the ſpoyling of the edge or point of the *Biſtori*, for every time that it is to be uſed of new, it muſt be ſet again.

So ſoon as the Inciſion is made, the Stone appears, and then the Operator lays aſide the *Biſtori*, and takes the Hook or *Crochet*; he is to hide it in his Hand as much as he can, the end of its Handle being towards the little Finger, and the fore-Finger covering the length of its Body: without drawing the Fingers out of the *Rectum*, the Hook is to be ſlipt in betwixt the *Pubis*, and the Stone in this manner.

When the Hook is behind the Stone, and that the Operator intends to pluck it out, the Handle of it ought to be in the Hand with the end reſting upon the Thumb, that it may be uſed with greater

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The Fingers are not to be taken out of the *Anus* before the extraction, nevertheleſs when the Stone breaks becauſe of its ſoftneſs or ſhape which is ſometimes crooked like a Creſſant, if the reſt cannot be extracted with the Hook or a little Forceps, the next courſe is, to remove the Fingers out of the *Anus*, and introduce the Button into the wound for ſearching of the Stone, and having felt it, conduct a Forceps upon the Button to lay hold of it, and gently draw it out.

By what Operation ſoever an Operator may cut, when the Stone breaks, though many Stones have been taken out, it is ſtill neceſſary to introduce the Button to ſearch and examine if there be no more fragments remaining.

When thoſe that are of Age and grown up, are cut by the leſſer Operation, it is not neceſſary to make the Inciſion ſo high as in the great Operation, becauſe one cuts exactly upon the Stone, and it is alſo eaſier to avoid hurting of the *Rectum*.

If a Patient hath been already cut;

the Inciſion is to be made upon the *Cicatrice* or the *Fiſtula*.

CHAP. XV.

The manner of both the leſſer and greater Operation for Women.

WOmen and Maids are cut by the leſſer Operation, introducing the fore-finger and middle-finger into the *Vagina Uteri*, if it can be done without Violence, or into the *Rectum*, for feeling of the Stone, and holding it firm, whilſt with the other hand the Operator preſſes the lower Belly to make the Stone come down. Then he is to make uſe of the hollow ſtreight *Catheter*, which being introduced into the *Urethra*, is to be held by a Servant, and the *Orifice* of the *Urethra* is to be dilated by a ſimple Dilatatory, conducted in the *Cavitie* of the *Catheter* : it is not to be dilated too far forward, becauſe the paſſage is ſhort, and that the dilaacerted *Fibres* may not hinder the unvoluntary emiſſion

emiſſion of the Urine, the dilatation being made, the *Catheter* is taken out with the Dilatatory, and the Fingers being ſtill in the ſame place into which they were introduced, the Stone is pulled out with the Hook or a Forceps, in the ſame manner as from little Boys.

Women and Girles may be excuſed from the violence which they ſuffer by the leſſer Operation, becauſe the great Operation is more convenient for the better ſucceeding in it, the Patient is to be placed upon the Chair, or upon the end of a Matteres, and that Conductor which is ſhaped like a Sword, and hath a bill, is to be introduced into the *Urethra*, then a ſmall ſimple Dilatatory; and having made a moderate dilatation, whilſt the Dilatatory is ſtill open, the Chirurgion according to his own diſcretion and the bigneſs of the Stone, may cut a little ſideways to the right and left, the external Orifice of the Paſſage, then draw out the Dilatatory, and introduce the Forceps along the Conductor, to take hold of the Stone, and to extract it in the uſual manner, its ſcarce

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credible how much the *Urethra* may be dilated both in Men and Women.

There are some Operators who having introduced the streight hollow *Catheter*, they thrust in one of the Conductors, shaped like a Sword that hath a bill; and the *Catheter* being drawn out, they slip easily in the other Conductor, which is forked, because the first has a line that directs the second. Between those two Conductors which they press betwixt the Fore-finger and Middle-finger of the left Hand; they thrust in a Forceps to continue the Operation. Others successfully make use of a narrow *Gorgeret* which serves for a Conductor to the Forceps. Mr. *Jonnot* makes only use of a hollow streight *Catheter*, or of a large *Prole* or *Stilet* for conducting the Forceps.

CHAP.

CHAP. XVI.

Of the Practice of the great Operation for Men, and of circumstances during the time of the Operation.

JOannes *de Romanis* a Physician of *Cremona*, in the year 1520. Invented and Practised at *Rome*, the great Operation, so called, because it requires more Instruments than other Methodes do.

Men who are cut by the great Operation occasion more trouble, not only in respect of the Operation, but likewise in respect of the Cure; because their *Urethra* is crooked, long and narrow, and their way of living renders that Part many times subject to more Diseases than those Parts in Women.

When the Patient is prepared and ready, he is set upon the Chair, or other ways laid upon the side of a Mattereſs or Quilt, placed upon a Bed or a Table of an indifferent length, his Buttocks a little raised, his Head and Body inclining backwards, and leaning upon

the back of a common Chair reverſed, and ſo ordered that the hinder Feet be near the Patients ſhoulders, and that he may continue ſtill in a good Poſture, two Scarfs are made uſe of in this manner; having laid them both together long ways, there is a knot tied in the middle of them, and they are put about the Patients Neck, the knot behind. If they be too long, they are ſhortned by tying a knot upon them, and a nooſe made of the ſame Scarfs is let hang down behind. This being done the Maſter taketh the Scarfs on the right ſide, and a Servant on the left, then both of them ſtand before the Patient, and make him ſet his Feet againſt them, each ſide of the Scarfs being double, the Maſter and Man each on his ſide makes one end of them come before upon the *Clavicles*, and the other end upon the Shoulder Blades, and then bring both croſways under the Armpits: there they twiſt them together, giving them two or three turns: after that they bring the Patients Knees as near as they can to his Belly, & at the ſame time draw

one

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one of the Scarffs betwixt the thighs, and the other on the outſide of them, and they joyn both together underneath, giving them one caſt over another, in like manner the Patients Heels are raiſed near to his Buttocks, whilſt in the ſame faſhion they tye his Leg; after that they make him put his four Fingers under his Soul of his Foot, and the Thumb below the external Ankle-bone, as if he were to take hold of his Heel. In this poſture they tye the Wriſt and Hand to the Leg and Foot, bringing the ends of the Scarffs under the Foot like a Stirrop, and then they draw them betwixt the Feet and the Thumbs, becauſe the *Ligatures* muſt be made indifferently ſtrait, which would hurt the Thumbs if they were tyed underneath, to which the Patients ſtrugglings would not a little contribute. Here you ſee the Figure of it, in which there is but one Servant repreſented leaning upon the Knee and Foot, keeping the Legs aſunder, and ſupporting the Patient that the Rowlings and Swathings may be ſeen; for there ought to be a

Man

Man on the other ſide, and ſometimes two on each ſide when the Patient is ſtrong.

This poſture is ſomewhat terrible to the Patient, and therefore ſince there are ſome Men of a ſtrong Reſolution and invincible Courage, if they be unwilling to ſuffer theſe *Ligatures*; it will be ſufficient to bind their Thighs and Legs in the manner deſcribed, and cauſe their Arms to be held by two Men; or perhaps they may like it better to have their hands tied a part by themſelves, making them lay their wriſts one upon another which being tied together by the midle of a Bandage wrapped two or three times about them and two indifferent hard Knots, the two ends are to be brought about the the neck and tied, together with a running knot, ſo that the hands reſt about the pit of the Stomach or the *Cartilago Enſiformis*.

I ſaw a Genteleman who had had his Leg cut off, cut at Mr. *Jonnots*. his Arme was tied on the ſame ſide with his Thighs and the want of his Leg was ſupplied by the number of Servants who held him

him fast if one or both his Thighs had been cut off, he might have been mastered by the number of Men who could have held him by the Arms and Stumps, whilst others leaned upon his Shoulders, without any use of Ligatures.

Women ought to be Situated in the same posture.

Whilst the Scarfes are applying, it is fit that the Chrurgion should speak to the Patient, but in few words, that he look upon him and encourage him with discourse, shuning every thing that is undecent, because one must be very reserved, to oblige those that are present to be silent and with respect to be attentive, which wonderfully comforts a Patient; calling to mind, that to laugh at the disease, the infirmity, or expressions of a Patient, is to insult over a man in affluction. *Neminem riseris ne miserum ririseris.*

It were better to have but a few spectators, because a great many may incommode the Operator, frighten the Patient, and put a bad construction on the accidents that sometimes accompany the Operation:

Operation : it is fit, as much as conveniently may be, that a Church-man ſhould be preſent to talke now and then to the Patient, that may help to divert his pain, and encreaſe his Patience dureing the Operation.

When the Patient is ſeated, the Chirurgion, is to place his People to ſupport him and make him ſpread open his knees, lean upon his ſhoulders, and to lift up the *Scrotum* or hold the *Catheter*, if a Servant preſent a Biſtori, he is to be on the right ſide of the Operator, who is to cut with the right hand ; and he ſhall hold it in this faſhion.

With the Right-hand in which he hides the Blade of the Biſtori. The Operator when he takes it, is to put his hand upon the handle, the other Servants are placed in the ſame manner for the leſſer, as for the great Operation ; but they hold the Patient in a different manner, as it hath been repreſented by the Figures.

When there is a *Hernia* or burſtneſs the *Scrotum* is to be lifted up very high, and

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and care is to be taken in making the Inciſion not to hurt the Teſticles nor the parts which cauſe the *Hernia*.

Before the Operation there is ſometimes a *Procidentia* or falling of the *Anus* occaſioned by the ſtraining of the Patient: if the falling be conſiderable, the Operator may endeavour to thruſt it up without violence, and then lay a Bolſter upon the *Anus*, which a Servant is to preſs hard: but if the Servants hand hinder the Operator, there is nothing to be put upon the *Rectum*; for after the Operation is over it is reduced, and many times returns again of it ſelf.

if the Patient have been cut already, the Inciſion is to be made upon the cicatrice, or the fiſtula, as hath been ſaid ſpeaking of the leſſer Operation one may cut on the Right ſide as well as on the Left, taking heed not to cut the ſuture, becauſe it does not ſo eaſily cicatrice, and is alſo attended by many accidents.

The Inciſion in Children is made at leaſt two fingers breadth in length; in men 3 or four fingers breadth or thereabouts, according as the Stone is thought

to

to be of bigneſs, and according to the Groſneſs of the Subject. Not that it ought to be made too large, for when the Stone is in the paſſage, if the Inciſion be too ſmall, recourſe may be had to a Cut with the Biſtori, or with a pair of Cizars in a convenient place. The Inciſion of the Skin and Membrances is eaſily made, but many times the *Urethra* is not ſufficiently opened unleſs one preſs the Biſtori hard in the furrow of the Staff; Inciſion is never made in the neck of the Bladder, but always in the *Urethra*, and experience convinces that a great Inciſion in that Operation is as ſoon cicatriced as a ſmall one.

The Patient being ſet in a poſture and bound with the Scarfes, his Arms and Legs are held by two ſtrong Men, and, if need be, two others take care to keep his knees aſunder, a Servant gets up behind the Chair to preſs upon his ſhoulders, duriug the time of the Operation, which is performed, if it be poſſible, by the leſſer Operation, or at leaſt in the great (which is commonly made uſe for Men and litttle boys) by introducing a

furrowed

furrowed *Catheter*, wherewith the Operator ſearches, and is certain if there be a Stone or not.

If nothing be felt with the furrowed *Catheter*, it is neceſſary to introduce a *Catheter*, whoſe bill is not ſo long, making the Patient void his Urine; and if there be a Stone it will by that means be more eaſily found, becauſe when it Floats, being little and ſmooth, it will follow the courſe of the Urine; and the *Catheter* will turn better in the Bladder. When the Stone is found the furrrowed *Catheter* is again to be introduced.

If the Patient hath been cut, it is harder to introduce the *Catheter*, and therefore one is to be taken of a ſize that would ſuit with a younger Subject, and ſufficiently long, according to the age of him that is to be ſearched.

There are ſome Operators who hold the *Catheter* themſelves when they make the Inciſion: others cauſe a Servant to hold it, who is placed at the ſide of the Chair, oppoſit to the Groyn whereon the Operator is to make the Inciſion; for example, the Chirurgion performing his Opera-

Operation on the left ſide of the future, the Servant ſhall be on the Patients Right-hand, and having wiped and dried the *Scrotum* and *Perineum*, he ſhall lift up the Cods with the Left-hand, and ſhall reſt his other hand upon the Rings and end of the *Catheter*, inclining the furrowing a little towards the Patients left ſide, and he muſt take care not to make it come out of the Bladder, which he may avoid: if he bring not the Rings of the *Catheter* too near the Belly. The Chirurgion ought to mind firſt bidding him hold faſt and not waver, and cauſing others to lean upon the Patients ſhoulders, becauſe at that very time the Operator ought to pull the future towards the right ſide, placing the Thumb of his Left-hand near the *Anus*, and his other fingers near the *Scrotum* having felt with the fore finger of the Right-hand, and obſerved the place where the back of the *Catheter* is in the ſame manner as one does to find the Vein before blood letting) pulling ſtill the future to the Right, with the Right-hand he is to take the Biſtori mounted, which the Servant pre-

ſion in the place deſigned, as you ſee repreſented by this Figure.

In making inciſion he is to ſearch for the furrowing of the *Catheter*, into which he is to thruſt the point of the *Biſtory*, he is to preſs hard, ſwathing above towards the Cods, and below ſinking the Wriſt, that the point of the *Biſtory* may be always directed into the furrowing underneath the *Catheter* that the Urethra may be exactly cut, avoiding the Scrotum, the Rectum and the Hemorrhoide veins; then he ſhall return back the *Biſtory*. And take the Gorgeret to introduce it into the furrowing; after that with the left hand he ſhall lay hold on the *Catheter* by the end which the Servant held.

To prevent the Fingers of the Operators left hand from ſliding during the time of the Inciſion, he may make uſe of a very narrow compreſs, to help him to preſſe and pull the ſuture towards the patients right ſide.

If in making Inciſion the Operator himſelf hold the *Catheter*, the Servant who extends the *Perineum* may upon the

ame account put very narrow Compresses betwixt his Fingers and the Skin, that so he may hold the two sides of the future firmer towards the Thighs; by that means the Humidity will not hinder him to press upon them as much as is necessary.

Monsieur Ruffin a sworn Chirurgeon of *Paris*, one of the ablest of his time, performed the Operation in this manner in the Hospital of the *Charity*.

After that he had introduced the *Catheter*, and was sure of the Stone, he caused a Servant placed on the Patients right side to lift up the Cods, and having dried the parts that were wet, the same Servant holding his hands almost open, put his right hand upon the future pulling it to the right, and the Skin to the left with the other hand which he rested towards the left Groyn, lifting up the Cods with both his hands: The Operator inclined the *Catheter* a little towards the Belly, and pressed upon the Rings with the left hand, whilst with the right fore-finger he marked the place of Incision; then was the

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Biſtory preſented to him, and during the time that the Servant held the *Perineum*, ſtretched to the right and left without the uſe of Compreſſes, he made the Inciſion as in the other way: This is the Figure of it; the Servant may alſo with one hand liſt up the Scrotum, whil'ſt with the other that is extended he preſſes hard upon the *Perineum*, holding between two fingers the place where the Operator intends to make the Inciſion. The Servant may likewiſe do otherways, it is enough that he hide his two thumbs in his hands, and with the two fore-fingers he may extend the *Perineum* for the ſame purpoſe.

The furrowing of the *Catheter* being diſcovered and the *Biſtory* returned back, he took a Conductor with an elbow towards the middle which is compoſed of two in the form of a Sword, he thruſt the Bill of it into the furrowing ſtill holding the *Catheter*, and when it was introduced into the Bladder, he drew out the *Catheter*, and conveighed his *Forceps* betwixt the Branches of the Conductor to introduce it into the Bladder:

the Conductor being taken out he continued the Operation.

These two ways are very good, and have both their advantages, because when the Operator himself holds the *Catheter* he is sure what place it is in; but also after the Incision, sometimes it is hard to find the furrowing because of Fat, Membrans and Blood that hide it; it is true that after Incision the point of the *Bistory* may be left in the furrowing, and may be held by some body whilst the Chirurgeon slides the Bill of the Gorgeret along the *Bistory*, but when a Servant holds the *Catheter*, after that the Incision is made and that the Operator hath given back the *Bistory*, as we have Just now described, he may put the Nail of his left Thumb into the Wound, and having found the slit or furrowing, thrust therein the Gorgeret which ought to be hid in his right hand, so that the right fore-finger cover the length of it, suffering nothing almost to appear but the Bill: So soon as the Bill is in the furrowing, he takes the *Catheter* by the rings in the left hand, as is here represented. And

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And now there is great care to be taken in introducing the Gorgeret into the Bladder, for if the Patient push hard he may make the *Catheter* to come out, and then bad accidents happen; for if one thrust forwards the Gorgeret and then the *Forceps*, when they are not in the Bladder, a space is made betwixt the Urethra and the Rectum. To avoid mistakes the Operator ought to have an attentive mind, and not talk. And then having passed the Bill of the Conductor called the Gorgeret into the furrowing of the Catheter, he is to hold them fast, keeping the Bill always in; And as if one intended by guiding and making it slide along and under the furrowing, to thrust the Bill upwards; by this means one is sure to introduce it into the Bladder, and holding it with his right hand the Catheter must be disengaged from the Gorgeret by turning it with the left, and then softly and easily drawn out of the Yard. A certain sign that the Gorgeret is in the Bladder, is the emission of Urine along the Conductor; that is, if there be any in the Bladder.

When the Gorgeret is in the Bladder, and the Catheter drawn out, it is taken hold of with the left hand, and a convenient *Forceps* with the right, which is to be thruſt upon and along the ſame Gorgeret in this manner.

Though the Gorgeret or Introductor be put into the Bladder, yet it may be forced out again by the Patients ſtrugling, which may be prevented, by cauſing ſome to preſs upon his ſhoulders, and others to hold him faſt by the hands and feet; the Operator in the mean time who then holds his Gorgeret with the left hand that he may take a *Forceps* in the right, muſt not forget to take notice if any of that which he hath introduced come out again; for if he perceive it much without the Inciſion, it muſt not be thruſt forwards to make it enter again as before, nor yet wholly drawn out, becauſe perhaps it may not be out of the Bladder, and if it were, it would be too great a riſque, becauſe the Urethra and other parts falling together again, a ſpace would be made betwixt the Bladder and the Rectum, as hath been already

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already ſaid; but having taken a *Forceps* of an indifferent ſize rather ſmall than too great, he is to paſs it along the Conductor, without forcing any thing; if he find any reſiſtance when the thruſts it gently forwards, the Conductor is to be drawn out; if he cannot but with difficulty open the *Forceps*, he may be ſure that he is not in the Bladder, and then without ſpeaking, the *Forceps* is to be taken out, and whil'ſt it is a waſhing in warm Water, and making dry, the Chirurgeon ſhall take the button with his right hand, and if need be lift up the Cods with the left that he may paſs it into the Wound, turning it towards the Yard, and conducting it upwards towards the Bladder, in this manner.

The Button being blunt hurts not the parts in paſſing, and when it is in the Bladder (which may be known, becauſe then it may be eaſily turned every way) the Stone is ſoftly to be ſearched for by gently jogging and moving the Inſtrument; which being felt, the Chirurgeon is to take the Button in the left hand, conducting with the right the

Forceps close upon the Button into the Bladder, this is the Figure of it.

If it be a crooked *Forceps*, whilſt it is introducing, the Bill being turned towards the Yard, the rings are more to be raiſed, as may be obſerved in this laſt Figure, in a manner different from the former Figure, Page 92. which repreſents the ſtreight *Forceps* conducted upon the Gorgeret with the right hand bending lower upon the left. The Crooked *Forceps* is made uſe of, when the Stone is thought to be very near to the Groyn; but moſt commonly the ſtreight *Forcipes* are ſufficient, and both the one and the other ought to be laid upon the line of the Button, ſo that it touch on both ſides.

When the *Forceps* is in the Bladder the firſt thing to be done, is to open it for dilating of the paſſage, then having joyned the Rings almoſt together, it is to be gently turned and moved every way to ſearch for the Stone, whilſt the *Forceps* is in the Bladder, the Teeth are not to be joyned again, for fear of offending ſome part, and then the Patients thighs

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thighs may be brought a little nearer together, and not kept at ſuch a diſtance during the reſt of the Operation as they were before the intromiſſion of the Catheter.

It is to be obſerved that as often as one would change a *Forceps*, or introduce it, there is a neceſſity of making uſe of the Button, except immediately after the Inciſion is made, when the Conductor is introduced, on which the *Forceps* is thruſt forwards.

Remember that after the Inciſion is made, and the Conductor introduced into the furrowing, when one would diſengage the Catheter, or that it is out of the Yard, the Patient ſometimes ſtrugles before the Conductor be in the Bladder; or other ways when the Urethra has not been cut enough towards the Bladder, or that the Bill of the Conductor be not dextrouſly thruſt into the Slit or Furrowing, inſtead of entering into the Bladder, a ſpace is made betwixt it and the Rectum. Then muſt the Conductor be drawn back; and if afterwards one cannot introduce the Button, it will

be

be neceſſary to take the ſame furrowed Catheter, or one ſomewhat ſmaller and leſs Furrowed: For better paſſing it into the Bladder, making uſe of the Second way of ſearching Men, deſcribed in the Ninth Chap. by that means the Catheter is gently introduced into the Urethra, without turning of it any way, leſt it ſhould come out at the Inciſion, and when it is paſſed into the Bladder, the furrowing is to be ſearched by the Wound with the Bill of the Gorgeret, that ſo the Operation may be continued.

When the Gorgeret is in the Bladder, if it be feared that the paſſage is not open enough, a cloſe dilatatory is to be taken, and held in this manner that one branch of the handle paſs upon the thumb betwixt the right fore-finger which the Chirurgeon is to extend a long the dilatatory, and the other three fingers underneath, that it may be held faſt; it is introduced along and upon the Conductor, and without turning it any ways, the bottom of the Inciſion is dilated in length, as much or as little as it is thought fit, making the branches of the handle

to

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to come near one another in this manner.

There is as little uſe of this made as can conveniently be, nevertheleſs if neceſſity require it is uſed; after which it is pulled out, and without parting from the Gorgeret, the Operator takes a cloſe *Forceps* conducting it into the Bladder to ſearch for the Stone, where it muſt be gently turned and jogged every way, as hath been ſaid.

It is to be minded alſo that it hath been ſaid, that ſo ſoon as the *Forceps* is in the Bladder, it may be moderately opened with both hands to dilate the paſſage a little, and at the ſame time to bring the Rings almoſt together, and afterwards with one hand it may be thruſt and moved gently to the right and left, up and down where the Sphincter of the Rectum is, to feel the Stone, ſometimes turning the *Forceps* ſo that one of its Rings be higher than the other, thereby endeavouring to lay hold of the Stone, which may be flat, or lye hid at one ſide of the Bladder.

When

When it is found, the *Forceps* is to be opened with both hands, to gripe what has been felt. The Operator is ſometimes ſo fortunate as to take good hold of the Stone in a ſmall time; which is to be known, becauſe after that the *Forceps* hath been opened, the Rings cannot be made to meet again, and ſome hard matter is to be felt betwixt the Teeth: This is the ſureſt ſign, for very ſmall Stones may be taken hold of about the middle of the *Forcipes*, where they are more bent than elſe where; which will not hinder but that the Rings may be brought to meet; but ſtill ſome hardneſs is to be felt. This hath happened to me, and it was thought that there had been nothing; but I felt that hardneſs in the *Forceps*, and I have the Stone of that Operation ſtill by me.

When the Stone is laid hold of, one muſt not at firſt pull towards him, but it is requiſite to turn gently the *Forceps* to the right and left, holding it with one or both hands according to the convenience of the Operator, that ſo he may know if the Stone lye right in the

the Teeth, and disintangle it from among the Plicatures, pulling to him afterwards without violence: the Rings of the *Forceps* are to be raised and low'rd alternatly, to make the Stone slide with greater ease. If one have made use of a crooked *Forceps*, the Bill of it must have been turned towards the Pubis just at the passage of bringing it out; and the Rings be very near the Yard: that one may not be mistaken, it would be necessary to put a mark upon one of the Rings of the *Forceps*.

When the Stone is in the *Forceps*, special care is to be had not to turn it quite round, because if the Stone be big or uneven, it will much confuse the parts of the Bladder: If the Stone be soft, it breaks and moulders, and the *Forceps* easily shuts; but then one feels as it were a heap of sand, and then the Rings are not to be brought wholly together, because then a small matter of gravel would be drawn out, and the parts of the Bladder might be hurt; the *Forceps* with what is betwixt the Teeth of it is to be pulled out, and this is to be re-

reiterated conducting it upon the Button, as often as ſhall be judged neceſſary: And then a Tent or Pipe is to be introduced, as ſhall be mentioned in the following Chapter.

When the Operator judges the Stone to be flat and of the ſhape of an Almond, he may endeavour to make one of the Teeth of the *Forcipes* ſlide under, and the other above; though commonly the Stones are taken ſideways, and when it is taken hold of, he is to turn the *Forceps* again, ſo that the thickneſs of the Stone may anſwer to the length of the Inciſion.

Sometimes a Stone of the ſhape of a large Hens-Egg is caught hold of by its two ends: which may be gueſſed by the great diſtance that is obſerved betwixt the Rings of the *Forceps*, nay one may ſee it when the Stone is near the paſſage; to keep it faſt, the *Forceps* is to be thruſt back into the Bladder, the Teeth of it a little opened that the Stone may be looſe, and it will turn without fail; by that means it is afterward taken hold of by its thickneſs ſideways, and the paſſage thereby leſs dilated. If

If the Stone be adherent and ſtick very cloſe, it were better to delay the extraction of it, becauſe ſuppuration contributes to the ſeparation thereof. And if the Operator cannot hold the *Forceps* faſt enough, he may make uſe of a Napkin to wrap the Rings in, that his hands may not ſlip.

When it is exceſſively big, it is better to let it alone than to expoſe the Patient to evident Death, eſpecially if Age and other circumſtances are contrary to the Operation. *Pareus* and *Beverovicius* adviſe to break it with *Forcipes* whoſe Teeth reſemble the Teeth of a great Saw: And *Tevenin*, Chap. 121. Of his Operations, propoſes the introducing of a pretty long Tent or Pipe, to hinder that the Stone fall not upon the Sphincter, that ſo the Patient may make his water; that Pipe ſhould ſhut with a Screw, that it may be uſed as need requires.

When all the Stones have been extracted in an Operation, it is not needful to introduce a Tent or Pipe: Nevertheleſs there are ſome Operators who always

always use them, to void, as they say, the clots of congealed Blood; but they liquifie and come out by the Yard, or by the wound without a Tent which hinders the reuniting of the divided parts that still are Bleeding. It is true that they who well understand the conduct of that Operation may succeed in it, without leaving a Tent or Pipe long in the place; but yet it is sometimes necessary to use it for some days when there is an Ulcer in the Bladder; that injections may be the more conveniently made into it.

CHAP. XVII.

What time the Patient may be kept under the Operation, and what is to be done, when it is hard and laborious.

AN Operation is called hard and laborious, when by a skilful man it is not performed in a short time. In such a case the Patient is not to be held in pain until the Stone or all its parts be extracted. Sometimes it so stops the passage

passage, that the Conductor or *Forceps* cannot but with great difficulty enter: and therefore an expert Chirurgeon will not scruple to take out his Instruments, and with his Finger or the Button thrust back the Stone into the Bladder; and will afterwards make use of the Button and *Forceps* to continue the Operation.

It many times happens that after that the Stone hath been often laid hold of, it escapes and mounts up again, because the *Forceps* gives way, or the Teeth of it are not good, or otherways because the Stone is monstrous in respect of the passage, or that it breaks when it is held too strait, or because it is soft, and cannot easily be extracted when it adheres.

These circumstances are to be observed very exactly, and the Chirurgeon ought not to be more careful in his Operation, than in considering the strength and Age of the Patient, with the time that he has been upon the Chair, keeping him under the Operation rather too short a time than too long, lest he be surprized by death, if he be made to endure too much: But if after the Operation hath

been methodically carried on, nothing is extracted becauſe there was no Stone in the Bladder, or that the Stone is ſmall, or if fragments remained, he may take the Button with a ſcoop by the ſmall or middle; and introduce the ſcoop or ſpoon into the wound, and ſo endeavour to extract ſomewhat, and this having been two or three times reiterated, he ought to make uſe of a Tent or Pipe proportionable to the ſubject, and mounted according to Art. For introducing it he may make uſe, if he pleaſes, and with more ſecurity of the Button, put into the Inciſion, and having dipped the end of the Tent in Oyl, he may conduct it along the Button even to the Bladder, in this manner.

The ends of the *Languette* or piece of Linnen wherewith the Tent is mounted, may be tied to the girdle that is made with the bandage, one before and the other behind: or otherwiſe one may carry an end along each Groin of the Patient, and leave them on the *Pubu*. Next day or ſome days after, the Tent is to be taken out, and if there remain

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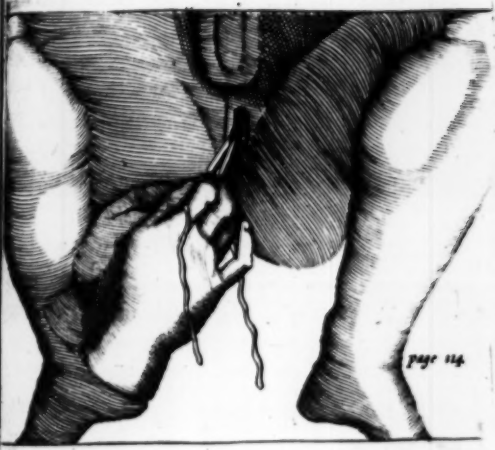
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ſtill ſomewhat in the Bladder, one may endeavour with the Hook, or the Scoop of the Button, or with the *Forceps* conducted by the Button, to extract the Stone whilſt the Patient lyes a Bed; or otherwiſe he may be placed upon the Chair as at firſt, yet without uſeing of Ligatures or Scarfs, becauſe then the Patient is weak, and it would put him in too great fear.

When the fragments are but moderately big, they may be extracted a Bed, and it is good to leave the Tent until one be certain that there is nothing more remaining within: which may be known, if one obſerve what came out during the Operation, or afterwards with the Medicines.

Moreover, after the Tent is taken out, one may introduce a Catheter crooked at the end, or a big Wire through the cavity of the Tent, without taking it out; and by ſeveral little joggs or motions, ſearch as far up as can be done without Pain. One may likewiſe make uſe of a Feather to clear the Tent of Blood, or of Slime and Purulent mat-

ters that are formed in the Bladder. The injection of warm Barley Water is proper, and after the first day one may gently press the Belly with the hand in time of Dressing.

CHAP. XVIII.

Of the Symptoms of Lithotomy.

THE Symptoms of *Lithotomy* are divided into those which accompany the Operation, and those that follow it, the first called Concomitant and the others Subsequent.

Accidents which accompany the Operation are Hemorrhage or Bleeding, the length of time which makes it to be called Laborious, the Bruising and Breaking of the Stone, the difficulty of extracting it, or the impossibility, the number and fragments which cannot be extracted because of their bigness, numerousness, or weakness of the Patient: sometimes also nothing is found, though the Patient hath been searched and examined before. A contusion Superveens if the *Forceps* be thrust too

too rudely or too frequently when it is in the Bladder, Excoriation, or even a Rupture of the Bladder, or other parts as well by the bigneſs and aſperties of the Stone, as by the Teeth of the *Forcipes*, if they be ſhut cloſe when they are in the Bladder, becauſe it is wrinkled, and the ſides of its Body or Bottom may be laid hold on without the Stone or with it.

The Symptoms that follow the Operation in the Cure by *Lithotomy*, are a painful tenſion of the Belly, the retention of Urine, Watchings, Inflammation in the parts affected, Looſeneſs, Diarrhæa, Worms, Ecchymoſes, Fluxions, Abſceſſes, Excoriations, Itchings and Putrifaction, Ulcers in the *Scrotum*, and the Neighbouring parts, Ulcers and Putrifaction of the parts of the Bladder, too great, or too long Suppurations; voiding of Purulent matter by the wound, or with the Urine by the Yard, Feavers, univerſal or particular Conſumptions or Maraſmus's, Hemorrhages as in the time of Operation, Syncope's Convulſions, Vomitings, Lightheadedneſs or Deliriums and Shiverings.

The painful tension of the Belly is caused by an inflammation that attracts a Fluxion, because the Ligaments which suspend the Bladder, and the other parts to which it adheres, have suffered violence: The Feaver and Restlesness proceed from the *Intemperies* of the chief parts, agitated by the passions of the mind; And the Hemorrhage from the Incision, or Erosion of the Vessels: The retention of Urine is occasioned by coagulated Blood, or the inflamation of the parts during suppuration, or by some little Stone fallen down from the Kidneys, or a fragment remaining after the Operation: The inflammation comes from a circular motion of the Humours; the Scourings, loosenes of the Belly, and Worms in Children through the abundance of Phlegme; the *Ecchimasis* is an effect of extravasated Blood; the Abscess is produced by a collection and continuance of Humours in the interstices of the parts: the too great and too long suppuration, by the quantity of the matter whereof the Abscess is formed, or by the Ulcerated Kidneys, and

by

by the liquefaction of the Humors of the whole Body, of which part do ſuppurate whilſt the reſt are diſperſed by Tranſpiration or Looſeneſs, which cauſes at the ſame time a Maraſmus or extenuation of the whole Body: The Ulcer of the Bladder is cauſed by contuſion and ſuppuration of its parts, which excites the running of Purulent matter by the Yard or Wound: Fungous carnoſities by a ſuperfluity of ill concocted and too ſerous Blood; the Itching and excoriation are the effects of the ſharpneſs of Urine, or of too ſtrait bandage; the Putrifaction of the Ulcer comes from the corruption of the Humors and of the Air, or from the too great humidity of Medicines, and the Virulence, from the Acrimony of the Humors and Medicaments: The Vomiting happens after the Operation, becauſe many nervous Fibres of the ſixth pair are diſtributed and inſerted into the Ventricle. There are other accidents occaſioned by the diſtribution of the Nerves, which paſs through the holes of the *Os ſacrum* common to the Sphincters of the Bladder and *Anus*,

which have been bruiſed or lacerated by the *Forcipes*, or by the aſperities of a great Stone, eſpecially when the Operation hath been hard and laborious.

The Fainting or Syncope, is occaſioned by a great Flux of Blood, and the diſſipation of the Spirits: The Convulſion happens by Vomitings, the Diarrhea & Hemorrhage, which hinder the Nerves from receiving a ſufficient quantity of Spirits: The Delirium and Light-headedneſs Superveens, when there has been ſo great a diſſipation of the Animal Spirits, that the Brain retains not enough for it ſelf, and for ſupplying the whole Body with a quantity ſufficient for performing the functions of its ſeveral parts. In a word, Fate puts an end to all theſe accidents by deſtroying the Machine; that is to ſay, by abolishing of Motion at the inſtant when the Soul is ſeparated from the Body.

If any be ſurprized that we have ſpoken nothing of Pain, they ought to conſider that that is a Symptome, or rather an eſſential property of all diſeaſes, of the parts that are capable of feeling, ſince

ſince it always happens, where there is an *Intemperies* with a ſolution of continuity of the ſoft parts and by conſequence it is more ſenſible in *Lithotomy*, than all the other accidents that we have been ſpeaking of.

Theſe Symptoms have their cauſes, their Diagnoſtick and Prognoſtick ſigns: ſome are the cauſe and the ſigns of others, and all the Symptoms in general, are cauſed by Pain, Fear, Hemorrhage, Contuſion and Dilaceration of the parts.

The Prognoſticks are taken from the time, the violence, and the ſtate of the ſubject in which the accidents happen. The Symptoms that appear at firſt, are not ſo dangerous, and thoſe which laſt long, or happen in a Cacochymick Body, are more to be feared.

An Operator who is expert in performing the Operation will avoid many concomitant Symptoms. There are ſome nimble blades who have the knack of feigning that they have extracted a Stone, and convey one, though they have found none.

The Symptoms that follow the Operation, are either by themſelves apart, or

or many together according to their Nature, corrected by various Medicins.

The first care is to asswage Pain by Imbrocations and Fomentations: a Hemorrhageis sometimes to be feared, and therefore astringent topicks are to be employed for preserving the treasure of life. The loss of Blood ceases commonly through the weakness of the Patient, because the Medicins that are applied to this part are dissolved by the Urine; and besides no other bandage but the contentive can be used, when in other parts one may put his Finger upon the Orifice or opening of the Vessel, or cut it in two, apply to it a Button, a Ligature, Pledgets and Compresses. It is commonly observed that the first dressing be kept on, for the space of Twenty four Hours at most: it is tenderly to be taken off, leaving a Pledget upon the place out of which the Blood does Issue, if it can be known; and if the Hemorrhage recurr, recourse is had to astringents.

CHAP.

CHAP. XIX.

Of the Method of curing thoſe that are Cut, and removing their Symptoms.

WE come inſenſibly to the cure by *Lithotomy*, the method of which is either general or particular. Having ſpoken of the Cauſes, Kinds, Signs and Prognoſticks of the Symptoms, it is now proper to give you a notion of thoſe things which ought to be obſerved from the time of the Operation until the perfect cure of the Patient. By that means we may treat in particular of the remedies againſt accidents; ſince they happen whilſt the Patient is in the Chirurgeons hands.

By the general cure by *Lithotomy* we underſtand that wherein no Symptoms happen which are of the Nature of a cauſe. And by the particular cure, that which is attended by troubleſome accidents, ſuch as cauſe the methods to be changed: of each of theſe we ſhall ſpeak apart.

Suppoſing

Suppoſing that the Chirurgeon hath ſucceſsfully performed his Operation, he muſt dreſs the Wound, and endeavour by the help of Medicines to cure it.

The firſt thing that is to be obſerved after the Operation, whilſt he that is cut is ſtill in poſture, and that with all expedition he is a clearing of the Ligatures, if any have been uſed, is to put upon the Inciſion a ſquare dry Compreſs about three or four Fingers breadth in bigneſs and indifferently thick, and holding it on with one hand, to take the Patient about the Body, and with aſſiſtance and help to carry him to Bed.

We have already ſaid that the Collar may be put on before the Operation, afterwards taking a Frond or Truſs ſuitable to the Patient, it is to be laid upon his Back above the Buttocks, that ſo the two heads or ſtraps called the twins, and which may be then called the ſuperiour, may ſerve for a Girdle, the Body or middle of the bandage, in the mean time, declining towards the place where the Inciſion hath been made, which hinders the ſtopping up of the *Anus*.

Before

Before the two ſuperiour ſtraps of the Frond or Truſs he tied together for making of a Girdle, Imbrocation is to be made upon the Belly and the Cods with the warm Oyl of Roſes and Camomile, to prevent the painful tenſion of the Body, and to cure it, and an Aſtringent Plaſter is to be applied to the Belly, with the *Ventriere* or Belly peice ſoaked in warm Oxycrat; then muſt the two ſuperiour or upper ſtraps of the Truſs be tied together towards the Patients right ſide, the one of them paſſing under the Collar.

Afterwards, the Compreſs which was put upon the Wound dry, and is ſince the Operation ſteeped in Blood, is to be taken off, and Medicines applied to the place.

If there be a Hemorrhage, Aſtringent Powders and Pledgets are to be made uſe of; and when there is no Hemorrhage, an indifferent thick Pledget covered with Aſtringent is to be put upon the Wound with a Triangular Plaſter covered with Aſtringent, and the Cods are to be kept up with a Truſs whoſe ends paſs along

along the two Groins, and afterward a ſmall Square Compreſs dipped in warm Oxycrat, as the Truſs ought to be, is to be put upon the Plaſter holding all the dreſſing of the Wound with one hand (for one muſt be ambidexter) and with the other hand taking hold of the Bandage betwixt the Thighs, by the end which is near the *Anus*, it is to be brought over the little ſquare Compreſs that is upon the Wound, and carried along the left Groin; declining betwixt the Thigh and the Hand that holdeth on the dreſſing, and that end is to be left upon the Girdle ſtill holding the dreſſing faſt: then one muſt take the other end which is more remote from the *Anus*, and giving it a turn outwards towards the Body of the bandage to make an equal compreſſure, it is likewiſe to paſs over the Square Compreſs that is upon the Wound, and diſengaging the Fingers wherewith it is held, it is to be carried along the rite Groin making but a very ſlight compreſſion: then the hand that held on the dreſſing is to be removed, and with the help of both hands

hands this laſt end is conveighed under the girdle before, and on the right ſide, and then tied with the knot, called the Mariners knot; the ſame is done to the other end on the left ſide; or otherwiſe if both ends be long enough, after they have been brought under the Girdle, they are tied together by the Collar towards the left ſide, during the whole time that the bandage is uſed, a *Ventriere* or Belly peace is to be applied to the Patient, and care had that the ends of the bandage keeps on the dreſſing of the Wound, for the Body of the bandage muſt not deſcend lower than the left Buttock: afterwards the Thighs muſt be made faſt and kept at a moderate diſtance from one another with the garter or thigh band tied together under the Knees, with the knot on the outſide towards the Thighs.

If it be a Woman that has been cut, the dreſſing is to be put upon the Belly as to Men, and the Pledget covered with Aſtringent upon the *Orifice* of the *Urethra* with a Plaiſter, Compreſs and the Frond or double T, of which

a

a Girdle is to be made as with the Truſs, and the other ends which make the tailes of the T, paſſing betwixt the thighs, and croſſways upon the dreſſing, will hold it faſt, and preſs it as little as one pleaſes. When the Patient has a mind to make water, the bandage is to be taken off; they are not ſubject to ſo many accidents, and they are ſooner cured than Men.

In Men the firſt dreſſing may be removed within twelve hours after the applicat on, renewing the Imbrocation, with the ſame Aſtringent and the ſame Belly piece, for four or five days at leaſt or more, if the Belly be Swelled or Pained; one may likewiſe make uſe of Fomentations of the Belly with rough Wine and Red Roſes, and ſometimes they are to be reiterated four or five times a day.

The Wound is to be dreſſed with the Liniment of *Arceus* half Melted, to make it Penetrate the more, with the Finger, or Feather of a Quill introduced to the very bottom of the Wound as gently as may be: then a little flat Pledget dipped in the

the ſame Liniment is to be applied upon the Lips of it, with a Trianglar Plaiſter, ſoaked in warm Oyl of Roſes, uſing a Compreſs, and a Truſs moiſtened with warm Oxycrat; and a clean dry *Frond* or bandage to be changed at every new dreſſing as at firſt: for the following days the Patients are to be dreſſed twice every four and twenty hours, duly changing the dreſſings, except that of the Belly, which may ſerve for the firſt days, and ever now and then the Patients are to be made dry; which is obſerved to be done when they are a dreſſing, not forgetting to make them clean for avoiding a Gangrene. They are to be dreſſed with all ſpeed and diligence, and the Wound kept open as little as may be, having a fire always in the Room to correct the badneſs of the Air.

After five or ſix days there is no more uſe made of Oxycrat, nor Aſtringent, nor of the Triangular Plaiſter, but only of a dry Belly piece; and in the Inciſion three or four drops of the Liniment of *Arceus* with a Feather or the Finger, and a flat Pledget upon the Lips

of the Wound. The Balſam of *Peru*, and of *Capivei*, which is called natural white Balſam, are Sovereign remedies for Agglutination; that of *Capivei* is excellently good from the beginning to the very end. Some take equal parts of the Liniment of *Arceus* and the Oyl of Eggs, others make uſe of the Liniment of *Arceus* during the whole cure, others again of *Capivei*; ſome there are that make a Mixture of equal parts of *Baſilicum*, of *Venice* Turpentine, and Oyl of Eggs, or the Liniment of *Arceus*, and the ſucceſs is alike, provided the Operation hath been fortunate, and no bad accidents ſuperveen.

Upon theſe Medicines a Pledget is put and a Plaiſter of *Diacalciteos* a little longer than the Wound, and of a breadth proportionable to the ſubject, a dry Truſs to bear up the Cods, a Compreſs, and a bandage upon the Wound, as has been before deſcribed, preſſing it a little harder than in the beginning: the *Jarretiere* or Thigh band is uſed till the cure be perfected. After the firſt days are over, it is proper to advertiſe the Patient to preſs with his hand a little upon

upon the dreſſing, that he may more freely make water in his Urinal.

Though the Wound of it ſelf requires conſolidation, yet care is to be had that the Lips and Teguments thereof turn not inwards; and after ſome days when the fluxion is over, or if none have happened, with the help of little and very narrow Compreſſes the Lips are to be kept equally raiſed, and a little diſtant, only at the *Orifice* of the Inciſion; for that purpoſe ſeveral Compreſſes are to be put near the Lip which is on the ſide of the left Thigh, to the end the bottom may conſolidate, before the Cicatrice be made. When one is ſure of the bottom, then he is to uſe deſiccatives upon a little Pledget, and ſeveral Compreſſes unequal in thickneſs and indifferently narrow, one on each ſide, and a Plaiſter to cover them, and over that another little Compreſs tranſverſly at the upper part of the Wound, and over theſe three, two others of unequal breadth, to keep the bandage, by that means, the faſter. If there grow up any fungous carnoſities, they are to be conſumed with calcined Alum, or with *Lapis infernalis.*

There are ſome Patients that by reaſon of a good conſtitution of Body are cured in eight, fifteen, or twenty days; but the ordinary time of curing *Lithotomy* is thirty or forty days.

It is prudence in a Chirurgeon to obſerve the alterations that happen to the Patient, that he may diſcover the bad Symptoms that we have mentioned, which change the method of the general cure, and which require to be prevented, or corrected by a particular method contrary to their Nature.

This is performed by Diet, Chirurgery, and Medicines: the Diet, until the ſeventh or eighth day conſiſts in abſtaining from Wine, unleſs the Patient be very weak; he is to uſe a Tiſanne made of the ſhavings of Harts-Horn, and Ivory, or with a little Lint Seed, and the Roots of Mallows and Marſh-mallows, or at leaſt, in time of need, he is to drink of Chalybeat Water, or of the Tincture of Red Roſes, yet not according to his Thirſt, but a little leſs for fear of a Looſeneſs; it is enough that in four and twenty hours he take five or

ſix

six messes of Broth, and very few Eggs: Blood-letting, and cooling and Anodyn Glysters are good if he have a feaver, and pain in the lower Belly, but all by the advice of a Physician. And after the first seven or eight days are over, and that the Symptoms have ceased, his food is to be made stronger, beginning with Porrage, or Panadoes, then a little Meat and Bread, after that he hath been Purged, which is commonly to be done about the fourteenth or fifteenth day after the Operation.

Chirurgery is necessary, when Blood letting is to be reiterated, abscesses and their *Sinus*'s opened, places where there is a disposition towards putrifaction scarified; sometimes Cizars are made use of, to clip off Membranes and other parts that are wholly corrupted; Medicines are changed to discuss tumors, and ripen Abscesses; the Ulcers of the *Scrotum* and Bladder are cleansed by Injections and other Medicines that resist mortification and putrifaction. Extraordinary Symptoms appear before one another, or many together which make a com-

plication: we ought therefore to ſpeak of the remedying of every one of them in particular.

It hath been ſaid that Pain is mitigated, by *Oxyrrhodinum* upon the Belly, the Groins, and the Cods; Hemorrhage by Aſtringents; a Feaver by Blood-letting, eſpecially if the Patient hath not loſt much Blood in the time of the Operation, or after, and if he have ſtrength: reſtleſneſs is conquered by cooling Apozems, Emulſions, and Soporificks after the firſt days; the inflammation of the parts after ſuppuration is extinguiſhed by the *Ceratum* of *Galen*, or by *Nutritum*; fragments and ſmall Stones are voided with the Urine, and by the injection of warm Barley water, or they are extracted with the hook, the Extractor, *Forceps*, or the Scoop of the Button. The too great retention of Urine is cured by paſſing the Womans Catheter into the Wound, and then by a Tent or Pipe left in it for ſome days; Gripings and Looſeneſs are ſtopped, by Anodyn and Carminative Glyſters, and by Juleps of Red Poppy, the Oyl of ſweet Almonds,

Plantane

Plantane Water, and Harts-Horn Jelly: Worms and Vermous matter the cauſe of their generation, are brought away by Medicines and Phyſick which help digeſtion, as thoſe into whoſe compoſition enter, Rheubarb, Wormwood, Tamarinds, *Aquila Alba* in a ſmall quantity, *&c.* The Ecchymoſes, Fluxion and moderate Tumors are diſſipated by reſolutives and diſcuſſing Plaiſters, by comfortative Cataplaſmes and Anodynes, according to the degrees of the evil, and the rules of Art, obſerving to apply more comfortatives, than ſimple Emollients and diſcuſſives, becauſe of the Humidity of the part: Abſceſſes are formed commonly above the Inciſion and many times preſſing the head of the Tumor with one Finger, and the ſides with other two, the Purulent matter is Evacuated by the Wound; but if it be perceived that the skin is very thin, and the matter ready to burſt forth in a torrent, they are to be opened to the very bottom of the *Sinus*, and the cure performed according to Art. Deterſive injections are made uſe of to mundifie and

cleanſe the Bladder; and Emulſions are given to the Patients, that the purulent matter may the more eaſily be evacuated.

Excoriations and Itching are cured by *Nutritum*, *Unguentum album Rhaſis*, the Cerat of *Galen*; *Pompholyx* diſſolved in the Oyl of Roſes, and other deſiccative Anodynes, taking heed not to compreſs the bandage for ſome days; and if the Excoriations and Itching poſſeſs a great ſpace, the Patient might for ſome time be dreſſed without applying the Frond or Truſs, but only the Triangular Plaiſter covered with convenient Medicines, upon the Medicaments of the place where the Operation hath been made, making always uſe of the Thigh band to keep the Thighs at a convenient diſtance one from another. The ſame thing is to be practiſed when the *Scrotum* or Teſtacles are much ſwelled and in pain, and on that occaſion Anodyn and emollient Cataplaſms, *&c.* ſpread upon Linnen Cloath cut in the ſhape of the Plaiſter called the Plaiſter for the *Scrotum*, are to be made uſe of, with a bandage or ſuſpenſory

ſory, which is applied as in other diſtempers of the Cods or Teſticles.

Patients that are cut are ſubject to other accidents when they have lain long upon their Backs; they are to be remedied according to their kinds and degrees, and when they abate, the common bandages are made uſe of, ſuch as the Truſs, Frond or double T. which is more proper in the end than in the beginning, becauſe it compreſſes more eaſily, and it is more commonly made uſe of for Women than for Men: to uſe it a right, the Girdle is to be put about the Patients Body, and one end of it being carried within the Collar, and both ends tied, one of the ends of the Tail of the T. is to be taken betwixt the Thighs, and making it paſs obliquely upon the dreſſing, it is tied to the Girdle in the oppoſite ſide to that from whence it is taken; the ſame is to be done to the other end, faſtening them together by a kind of a knot called the Mariners knot, having a care not to ſtop up the paſſage of the *Anus*.

Fainting

Fainting, Convulsion, and Vomiting, go often hand in hand together; but the last appears more frequently than the others; it is remedied by Wine, and by cordial Potions made of Treacle; the Confection of Hyacinth, Alkermes, Coral, prepared Pearle, Powder of Vipers, Syrup of Pomegranats, in Balm Water and Scorzonera Water, *Carduus benedictus*, and Woodsorell, &c. according to the various indications: these Medicines and the Dose of them are to be chosen and determined according to the advice of a Physician, giving them at first in a small quantity often renewed, because of the debility of the Stomach.

When the Vomiting is stopt; the Convulsion ceases, and the fainting is cured by succulent nutriment, such as good Gellies, strong Broths, new laid Eggs which strengthen the Patient if they stay with him: the reason is evident, because inanition is the cause of these two Symptoms, and the Animal Spirits being but in a small quantity, prick the Nerves, which contract and draw towards their Origination. The

The Wound does ſometimes foul, and by too great ſuppuration, according to *Guy* of *Chauliac*; it is obſerved to degenerate into a ſordid Ulcer, and moſt commonly virulent, becauſe of the Acrimony of the Urine, and irritated Humours that grow mordicant and biting. Theſe kinds of Ulcers are never without Inflammation, Itching, and Excoriation of the part: for ſuch accidents we are to make uſe of diverting, reſtraining and local Medicines, applied according to the Temperament of the part, and the counſel of the ſame Author, in the Chapter of Wounds with Hemorrhage: When many Symptoms appear together, the ſame Rule is to be obſerved, and to have regard to the order, the urgency and the cauſe, and eſpecially to that which is moſt urgent, amongſt other things careſully obſerving the effects of topical Medicines, wherein Chirurgery does moſt conſiſt.

For curing of Diliriums and Light-headedneſs, ſtrong broths are given, minced meat made with Veal, Pullets, Partridges cut ſmall and put into an earthen

then Pot glazed, without water, well luted, and digeſted *in Balneo Mariæ*; hearty food that is full of good Juyce, and of eaſie Concoction, for ſpeedy repairing of the inanition, and tempering the Animal Spirits, the truth is a Dilirium with cold in the Extremities are of ſuch affinity, one with another, that they may be put into the ſame rank, and a Dilirium after *Lithotomy* is, as it were, the laſt degree of the Diſeaſe, the ſtrugling of Nature, and the forerunner of Death.

CHAP. XX.

Of the Iſchuria, or ſuppreſſion of Urine.

THE Bladder is a Membranous part, that may be diſtended and enlarged by the quantity of matter contained therein, and when it is full or ſtimulated, that which is within opens the Sphincter that it may make to it ſelf a paſſage into the *Urethra*.

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When all things are in a natural ſtate, Man ſuffers no inconveniency becauſe the things contained within are in due time evacuated; but congealed Blood, or coagulated *Pus*, condenſed Seed, a Stone, a Fungous Body, groſs Humours, or Phlegm with Sand, one or more of the inferiour Vertebraes Luxated, hardened Excrements, a Child dead in the Mothers Womb, a Carnoſity or Calloſity ſometimes ſtop the Sphincter of the Bladder, or a place of the *Urethra*, it is the ſame when a Viſcous Humour cauſes a Numneſs of the Bladder, or when a Patient is in a dull and drouzie fit; which is occaſioned by a diverſion of ſenſation, an extaſie in the Brain, or a convulſion of the Nerve which goes from the *Os ſacrum* to the Sphincter of the Bladder, and by Malignant Feavers.

Beſides thoſe cauſes of ſuppreſſion of Urine which we have reckoned up, we are to take notice of the ſhrinking or flagging of the *Urethra*, to which Old Men are ſubject; the Compreſſion of the Neck of the Bladder cauſed by the falling down,

down, or inflammation of the Matrix, or the Proſtates and Paraſtates, the internal *Hemorrhoide* Veins, or by a great quantity of Urine which diſtends the Fibres of the Bladder, as is related by *Pareus*, L. XVII. of a Young Man, who having kept his Urine too long, fell into a ſuppreſſion though he had no Stone, and was cured by the Catheter. *Fabrit. Hild.* ſays, L. *de Lith.* Chap. 3. Col. I. that that excellent Mathematician *Tycho-brahe* being in a great aſſembly at *Prague*, where being forced to keep his water very long, he fell into ſo violent a Suppreſſion, that he could not be cured, but died of it.

The retention of Urine, from what cauſe ſoever it proceed, produces a violent Pain, and inſupportable inflammation in all the Neighbouring parts of the Bladder, from whence a ſuppreſſion is occaſioned, becauſe the Urine is not voided, and that it is continually augmented in quantity. In that caſe Patients are all over in a heat, their eyes look red, their face burning, have an Oppreſſion, Reſtleſneſs, Feaver, a hard, painful

painful and very large Swelling above the *Pubis*; bilious Vomitings, and all these troublesome Symptoms reduce them to such a state, that without speedy help, they expect nothing but death.

The Chirurgeon will know that it is a clot of Blood that is the cause of the Suppression, if the Patient hath been lately Wounded in the Kidneys, or hath pissed Blood; if an Ulcer in the Kidneys has preceded, and the Patient hath made Purulent water, he may conjecture that a collection of thick and viscous *Pus* is the cause of it: if the signs of the Stone have appeared, he is to acquaint the by-standers with it, he may discern it from a *Fungus* by the Catheter, unless the Stone be wrapped in a Coat; he may know if it be a Carnosity or Callosity, by means of the Catheter or a searing Candle. I say nothing of the Patients manner of living, whose excesses may have been the cause of sharp Humours, or a great inflammation: nor shall I neither speak of other causes which manifest themselves. Now if many causes of Suppression joyn together, the diversity

diverſity of Symptoms will ſerve for a ſign to make the Prognoſtick by.

The Patient cannot for many days endure a Suppreſſion, without being much weakened and in danger. When it is cauſed by a falling down of the Matrix, there is no more to be done, but to reduce that part; when the *Hemorrhoides* preſs the Neck of the Bladder, they muſt be opened with a Lancet or Leeches; the Numneſs of the Bladder is remedied by a grain of Salt or Nitre put into the paſſage of the Urine, or with a compoſition of *Mel Roſatum* and the Powder of *Hiera*, or the Oyl of Scorpions: when there is congealed Blood, Purulent Matter, or thick Phlegm in the Bladder, we may make uſe of an injection of *Oxymel* with the Oyl of ſweet Almonds; in the Flagging of the *Urethra*, hollow Wax Candles are imployed; if there happen any Carnoſity or Calloſity in it, they are incided and eaten off, and afterward a Leaden Pipe introduced into the place. When one hath kept his water too long, if he be afraid of being ſearched, bags of Pellitory of the Wall moiſtened

moiſtened with the Oyl of Capers, or of Turpentine are to be laid upon the *Pubis*; and if he do not find eaſe upon that, he is to be perſwaded to ſuffer the intromiſſion of the Catheter. The inflammation of the Rectum, the Matrix and Proſtates is allayed by Blood-letting, and Glyſters of Oxycrat, Pellitory Water, or the Decoction of it with *Mel Roſatum*, and a Bath of warm Water.

For all ſuppreſſions of Urine, when there is no other apparent diſeaſe, it is of ſingular advantage to let Blood, give cooling Glyſters and Bath; becauſe commonly they are cauſed by meer inflammation, and the weakneſs to which the Patient is reduced, does often laxat the parts, and make way for the Emiſſion of Urine, the retention whereof puts him in danger of Death.

Galen 13. of the *Meth.* before *Pareus* L. 17. C. 37. adviſes not to give Diureticks, nor ſtrong purgatives before Blood-letting; becauſe they may accelerate the motion of Humours, or of Præternatural Bodies towards the Bladder, and fill it fuller, whilſt the obſtruction

of the Sphincter hinders the evacuation of the Urine.

But though all remedies have been uſed; yet ſometimes the Patient is not eaſed; in that caſe if he cannot be ſearched, and the diſtemper be very urgent, it is better without delaying ſeveral days, to bring him to conſent to be cut, if he be troubled with the Stone. And if it be only Urine retained through an inflammation of the Sphincter, or by a thick and viſcuous matter, it will be neceſſary to Prick or Tap the *Perineum.*

CHAP. XXI.

Of the Puncture or Tapping of the Perineum.

IT is to be ſuppoſed that the Patient hath found no eaſe from all the Medicines that have been adminiſtred unto him, and that the ſuppreſſion continues with ſuch Symptoms as give ground to a ſad Prognoſtick, and call for ſpeedy relief to the Patient.

The

The great relation that there is betwixt *Lithotomy*, and the Pricking or Tapping of the *Perineum*, gives us ground to propose three ways of Practising it; and seeing they have no proper names we shall distinguish them by those of the various Methods of *Lithotomy*, to wit, the High, the Great, and the lesser Operation.

Though it hath been said, that the High Operation is not in use, nevertheless it would seem that the great Tumor above the *Pubis*, caused by the suppression of Urine, especially in an extenuated Patient, might render the Operation easie, without any fear of hurting the parts of the lower Belly; and that for that purpose, having Prickt the Tumor with a Lance as deep as the Bladder without Tying the Patient, it will be sufficient to introduce a Wire or Stilet, that may serve for a conductor to a crooked and convenient Pipe, passing it into its cavity.

The High Operation of Tapping the *Perineum* may likewise be practised by means of a Trocart with which the

Punction may be made in the Tumor above the *Pubis*; it may be certainly known when the Bladder is open,& then a Wire is to be paſſed into it; and having pulled out the Trocart, the Wire will ſerve for a Conductor to the Pipe, juſt ſo as to the Parakenteſis or Tapping of People in Dropſies. We ſhall give the deſcription of this Trocart, and of the manner of uſing it, when we come to ſpeak of the third way of Pricking and Tapping the *Perineum*.

The ſecond way that is in uſe: is the great Operation, as I have ſeen it practiſed by men of great skill and reputation, whoſe method I have followed. There needs no more but a Pipe or *Canula* mounted, a ſmall Tent proportionated to the Cavity of the Pipe, two Plaiſters, and two Compreſſes the one a little bigger than the other.

All things being in readineſs, and the Patient ſeated in poſture and held as for *Lithotomy*; to be more aſſured of the way that muſt be taken in making the Inciſion the furrowed Catheter is to be paſſed into the *Urethra* as far up as it can

can go, without forcing any thing; if the inflammation be moderate, or if there be no carnosity, nor other obstacles, it is to be introduced into the Bladder: A Servant or the Chirurgeon himself may hold the Catheter, and he is to observe all circumstances as in cuting for the Stone, making the Inciſion lower than for *Lithotomy*, and ſhorter upon the ſlit or furrowing; into which he is to thruſt the Bill of the Gorgeret, to introduce it the more eaſily into the Bladder. It is fit that the furrowing continue like a gutter, without any thing to ſtop it at the Bill or Extremity of the Catheter; the voiding of Urine is a certain ſign that the Gorgeret is in the Bladder; and then the Catheter is to be diſengaged and ſoftly pulled out. The Chirurgeon is to hold the Gorgeret in one hand, and in the other, the Tent or Pipe mounted with the end dipped in Oyl, and he is to conduct it into the Bladder, by means of the Gorgeret, or in defect of that, if it be come out of the Bladder, he may take the Button with a Scoop, and uſe it as

hath been ſaid already. If there be no Button, one may make uſe of a big Wire, which being introduced into the Bladder, will ſerve for a conductor to the Tent or Pipe.

Though one could not paſs the furrowed Catheter into the Bladder before the Operation, yet it will eaſily enter after the Inciſion, becauſe that little Blood that is ſpilt, will diſſipate the Spirits which cauſed the inflammation and tenſion in the parts.

Tavenin Chap. 121. of his Operations propoſes, not to introduce the Catheter, but the Patient being put into a poſture to make the Inciſion with a *Biſtory* betwixt the *Anus* and *Scrotum*, on the ſide of the Seam or Suture, in the ſame place that it is made in for *Lithotomy*; being come, (ſays he) near the Bladder, it is to be opened, thruſting the *Biſtory* or Lancet boldly up, until that the Urine come out, then the Tent is introduced, and ſo the Operation is accompliſhed.

It is not convenient to evacuate all the Urine, if it was exceſſive in quantity; becauſe

becauſe too great evacuations are always hurtful, according to *Hippoc.* Book 2. of his Aphoriſms; but having voided as much as may conſiſt with the ſtrength of the Patient, with a little piece of Linnen Cloth one may ſtop the Orifice of the Tent or Pipe, and having put a Compreſs upon it, ſome Body is to hold his hand thereon, aſſiſting the Patient to Bed; then lay upon the Tent a thick Pledget covered with Aſtringent, a little Plaiſter; another moderate Compreſs, and over that the Triangular Plaiſter covered likewiſe with Aſtringent, and another Compreſs ſtill upon the Plaiſter, a Truſs to bear up the Cods, and the Frond or double T. with the Thigh-band, as hath been deſcribed. The bandage that is only contentive, hinders not but that a little Urine may come out; nevertheleſs when the Patient hath reſted and taken refreſhment, he is to make Water through the Tent without pulling of it out.

In dreſſing the Patient the Chirurgeon is to examine if it be a *Fungus* which cauſed the ſuppreſſion; and he may

know that, by the Finger or the ſtreight Catheter, by inſpection into the matter that is voided with the Urine, or by the injection of warm barly Water, Deterſives and the other Medicaments that are uſed in dreſſing ſuch a Patient. If a Stone be felt, it is to be extracted with the Scoop, the Hook or the *Forceps*.

Fungus's are fetched off by injections; if it be an Ulcer, proper remedies for cleanſing it are to be uſed. An inflammation is more eaſily cured than any other diſtemper, becauſe many times it is kept in being by the retention of the Urine. When the cauſe of the ſuppreſſion is removed, the intention of the Artiſt ought to be the reuniting of the parts: And therefore the Tent is drawn out, and the Patients are dreſſed like thoſe that are cut of the Stone, according to the general cure, if no accidents appear, or the particular method, by remedying every Symptome.

If the Catheter cannot be introduced into the *Urethra*, or if the Patient will not admit of it, the Operation is more Laborious

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Laborious; nevertheleſs ſeeing it is a preſſing diſtemper, for the prolongation of life, there is a neceſſity of Operating after another manner, to wit, by the high operation that hath been mentioned, or after that way to which hath been given the name of the leſſer Operation for the Pricking or Punction of the *Perineum*: for that end one may make uſe of an Inſtrument called *Trocart*, a Stilet or Wire, and a Tent or Pipe mounted. I invented this Trocart above five years ago and this is the Figure of it.

This Trocart may be made of various kinds of Metal, excepting the point, which ought to be of Steel; it is ſeven or eight Inches in length, that it may be the more commodious for uſe, and as big as an ordinary quill: in the ſhape of it ſeveral things are to be conſidered; for the end of it which is of Steel, is of a Pyramidal and Triangular Figure. This point is about a Fingers breadth in length; in one ſide of it there is a furrowing that reaches from the point, or very near it, to the other end of the Trocart,

Trocart, and becauſe of that furrowing the Inſtrument in its length repreſents a ſtreight Catheter for making Inciſion, becauſe it is hollow on the one ſide and round on the other, which is the out ſide of it. The Pyramide of Steel tapers and grows ſmaller from the baſis till ye come to the point, but from that baſis to the other end of the Trocart it is alike in bigneſs.

The Wire or *Stilet* is ſtraight, indifferently ſmall, of the ſame bigneſs all along, and ſupple and pliant, about eight Inches long, proportionable to the furrowing of the Trocart.

The mounted Tent, that is uſed in this Operation, may be crooked for the high and ſtraight for the leſſer Operation in the Punction of the Bladder, long and ſmall in proportion to the Groſſneſs and Age of the Patient, that ſo the end may be thurſt into the Bladder, without making too great a *Solutio Continui* it is to be obſerved that the end of the Tent, where its eyes are, ought to be proportioned to the middle part of the Pyramide of the Trocart, that

that it may eaſily enter into the Orifice of the Punction, and that the body of that Tent be of a Conick Figure, growing bigger and bigger by degrees, as it comes nearer the head where the Rings are, though the extremity of the Tent, were ſmaller, yet it might ſuffice for conveighing of the Urine; but it would be uſeleſs, if ſome more thick and viſcuous matter were contained in the Bladder.

In uſing of theſe three Inſtruments; when the Patient is ſituated in the poſture that hath been ſaid, the Cods are lifted up, , and having marked the place where the Punction is to be made in the *Perineum* on the ſide of the Seam or Suture, the Trocart is thruſt in, and ſinking the end by which it is held, the ſlit or furrowing being upwards, the Pyramide is to be thruſt on forwards towards the Body of the Bladder, which being much diſtended, is therefore eaſily opened.

So ſoon as the Trocart is within, the Urine will come running out by the furrowing, and the Wire is to be taken, and

and conducted into the Bladder by the ſame furrowing; afterward the Trocart is drawn out, in place whereof, holding the Wire in one hand, the Tent mounted is to be taken, and paſſing the Wire into its Cavity, it is to be made to ſlide along the ſame. When the Tent is near to the *Perineum*, the Wire is to be taken by the end, and the Tent at the ſame time conducted into the Bladder, we may know that it is in, when the Urine comes out at its Cavity: And then the Wire is pulled out; and as much Urine ſuffered to be voided as may be thought convenient, other things being to be performed as in the other manner called the great Operation. This Trocart has one thing that is ſingular, which is, that ſo ſoon as the extremity of its ſlit is in the place where the Water is, the Urine is voided, without any danger of being thruſt too far in.

There are ſome who make uſe of another Trocart for the ſame Operation this has a ſolid and round point of Steel about a Fingers breadth in length; others cauſe it to be made Triangular, or a little flat and

two-edged; but ſtill proportioned to the Tent or Pipe, the inſtrument in its length is ſtreight and hollow, and has two openings near the baſis of its point; that Inſtrument is paſſed into the Tent, and in that poſture the punction is made, the opening of which is always leſs than the Orifice of the Tent; and it cannot be introduced without great pain to the Patient; beſides, this Trocart muſt be Thruſt deeper in than the other, before the Urine can be perceived to come out. All men are free to examin and try thoſe things, and to chooſe what pleaſes them beſt.

Theſe Trocarts may ſerve for other Operations, as in a kind of Hydrocele, where the Waters are gathered together, without being ſtilled into the very ſubſtance of the Membranes; in the Parakenteſis; or even in making perforations through the Skin, and paſſing the Silk and Stones becauſe about three or four fingers breadth from one end of the Trocart that was firſt deſcribed, a hole may be made like the eye of a great Needle through which the Silk may be paſſed.

Every

Every time that it hath been uſed, it muſt be new ſet, for the Urine blunts the edges very much. It is good to practiſe ſuch kind of Operations upon dead Bodies: for that end, one muſt with a Syringe Squirt as much matter as poſſibly he can, into the Bladder, then tie a Ligature about the Yard, and make the Punction as hath been deſcribed, and then make a diſſection of the Bladder, to obſerve what hath been done, that ſo he may take his meaſures for another time.

We may avoid offending the *Rectum* by conducting the point of the Pyramide towards the Bladder, which then is much diſtended, and we need not fear to open it in the Body, becauſe theſe Wounds are not abſolutely Mortal. And though they are ſaid to be harder to conſolidate in the Membranous part thereof, nevertheleſs we ſhould baniſh ſuch apprehenſions, becauſe we ſee by experience that they are cured, and that the buſineſs is to ſave the life of a dying Man.

They

They to whom Fiſtula's do remain after the Punction of the *Perineum*, make uſe of a Tent which they cauſe to be opened, and ſtopt now and then for the voiding of the Urine: they may be made to ſtop with a Screw for greater ſecurity. The ends of the Linnen Cloth or Languet of the Tent; are tied the one before, and the other behind to a Girdle, held up by a Collar, like thoſe which have been deſcribed when we ſpoke of the bandage of the Yard for a *Phimoſis* Chap. X. If ſome Symptom of *Lithotomy* ſucceed the Punction of the *Perineum*, it is to be remedied according to its kind; and when none appear, or if they be cured, the Patient and Chirurgeon may have good hopes, and both doing their duties, with external aſſiſtances the *Lithotomy* and Punction of the *Perineum* are brought to a perfect cure. Nevertheleſs what care ſoever the Chirurgeon may have, and how obedient, confiding and quiet, ſo ever the Patient may prove, aſſiſted as he ought to be by thoſe who attend him, and the adminiſtration of proper

Medicines

Medicines, yet ſometimes he hath the trouble to be incommoded by the other diſtempers contained in the following Chapter.

CHAP. XXII.

Of diſeaſes that happen after cutting for the Stone, and of the way of curing them.

GUY of *Chauliack* in his ſecond Treatiſe ſays, that if there be no Metaſtaſis of the Humours into Apoſtemes, they are terminated by Diſcuſſion, Suppuration, Obduration and putriſaction and afterward he ſpeaks of the manner of treating and curing them. This ſhews that there is a difference betwixt their term, their curing and their cure, the end of one diſeaſe may be the beginning of another; the cure hath an uncertain end, though healing be that which is propoſed according to Art; we ſee but too many inſtances of this in thoſe that are troubled with the Stone; that evil is terminated by the extraction of the Stone; and that Stone taken out

out, or that the diſtemper ended by the Operation, produces a Wound, or other accidents, the cure of which is neceſſary; and which nevertheleſs do not always terminate in a cure, but ſometimes in a new Stone, a Fiſtula in the *Perineum*, an involuntary ſpilling of the Water, a preternatural voiding of excrements, or in many diſeaſes together; they have each of them their Cauſes, Differences, Signs, Prognoſticks and Ways of Curing.

We ſhall ſay nothing as to the Stone which may be obſerved after that the Patient hath been under cure; we muſt only take notice that the cauſe of it may be this, that there is a Quarry in the Kidneys, which from time to time furniſhes the Bladder with Stones, and then the Operation ought to be delayed, unleſs the Patient be fully recovered in ſtrength, the ſeaſon be favourable, or that the accidents be remedied; And above all the Patient had need of a very great ſtock of reſolution to endure a ſecond cutting.

The Fiſtula in the *Perineum* where-

of we ſpeak is a Sinuous Ulcer below the *Scrotum*, with a Calloſity along the length of it, by which the Urine iſſues out. It is cauſed by the Chirurgeons fault, or by the Patients, by the ſupervening of accidents, or indeed by many things concurring, when the Chirurgeon and Patient do not do their duties, and that bad and violent Symptoms appear in the time, or a little after the Operation.

By the fault of the Chirurgeon; when in the beginning he ſuffers the Lips of the Ulcer to be to ſoon joyned together, before he be certain that the Bottom of it is deterſed and agglutinated, or because no accidents appearing he hath dilated the Bottom of it to much, and that he hath not had care after the firſt eight or ten days at moſt were over, moderatly to Compreſs the bandage, and to make uſe of ſmall and very narrow Compreſſes laid upon the two ſides of the Inciſion.

On the part of the Patient, when his Urine being too ſharp corrodes the *Vrethra*, and hinders the reunion, or that he lies not ſtill as he ought, not obſerving

ſerving Directions, and not ſuffering himſelf to be treated according to the rules of Art; to which muſt be added his being emaciated, the abundance of Urine, and if he moderate not his paſſions, or exceed in his food, the ſuperfluities whereof cauſes a too long ſuppuration.

The moſt remarkable accidents that contribute to the Fiſtula, are a Putrifaction, which cauſes great loſs of ſubſtance in the *Vrethra*, and adjoyning parts; an Ulcer in the Bladder, or Kidneys, the ſuppuration whereof requires that the parts be kept dilated.

The differences of theſe Fiſtula's are drawn from hence, that ſome of them are even and ſtraight from the Skin to the *Vrethra*, without any other profound or ſuperficial ſinuoſity, and are apparent on the ſide of the ſeam; others have their *Orifice* in the *Rectum*; ſome are accompanied with great loſs of ſubſtance, others have one or more ſinuoſities in the *Vrethra*, and in the neighbouring parts, or otherwiſe they happen in a bad ſubject; and theſe differences are

diſcovered, if it be obſerved in time of dreſſing the Patient, that thirty or forty days after the Operation, the Ulcer cicatriſes, except one or more little paſſages, or a ſmall Lump or Tubercle, which is named, *the Pullets rump* on the ſide of the ſeam, through which the Urine eſcapes; or if the Patient being much extenuated, the ſuperveening accidents have cauſed a great loſs of ſubſtance in the *Vrethra*, or that new Fleſh cannot breed; the iſſuing of the Urine by the *Anus* makes it apparent that the *Orifice* of the Fiſtula is in the *Rectum*.

All Fiſtula's in the *Perineum* are not alike hard to be cured; for the firſt kind may be taken into cure, provided there be no great loſs of ſubſtance, and that the ſubject be good, the reſt being commonly incurable; ſome of thoſe who are troubled with Fiſtula's have this comfort that they do not always run. If the ſubject be good, not too lean, and the Ulcer filled with well conditioned Fleſh, the cure of the Fiſtula may without interruption be undertaken: but if the Patient be extenuated, or if there be great

great loſs of ſubſtance in the *Urethra* with Callous Fleſh, the cure is not to be attempted, until the ſtrength be reſtored, that it may be tryed if new Fleſh can be procured. In that caſe he muſt be comforted, giving him hopes that at another time he may be cured. Thoſe that have their *Orifice* in the *Rectum* are ſometimes leſs troubleſome and they are not to be tampered with.

For curing of the Fiſtula, we ſhall not ſpeak in this place of the univerſal regiment, we ſuppoſe that to have been obſerved, either whil'ſt the Patient was under cure for the Stone, or ſince, but we ſhall only treat of the particular management of that cure. Authors ſpeak of Potions and many Topical Medicines for the cure of Fiſtula's: but ſince my deſign is only to deſcribe what I have obſerved to have been ſucceſsful, I can affirm that many have been cured by the following means; which conſiſts in introducing into the Bottom of the Fiſtula, a Cathereticke Trochiſque deſcribed in the laſt Chapter; next the falling off of the Eſcar is to be procu-

red by Basilicum; and then the Patient is to be dressed like one that hath been cut of the Stone after the seventh or eighth day; some make use at the same time of a desiccative Wax Candle, which they thrust into the Yard up to the bottom of the Fistula: others cure them without the use of Wax Candles; when any accident appears, it is to be remedied, as hath been said Chap. XIX.

If those that are fistulous are to be pitied, they who are troubled with an unvoluntary emission of their water by the *Urethra*, ought also to be ranked amongst the Miserable, as those also, who pis not at all: But they from whom the gross Excrements drop against their will, surpass the rest in Misery. What may be said then, if one should suffer many of these Inconveniences at the same time?

The spilling of the Water is caused by a Palsie in the Sphincter of the Bladder, by the Incision of its Fibres, or by a great Dilaceration, when a big and rough stone hath too much widened the Passage, and hath caused a Suppuration of long continuance.

The

The Kinds and Differences are taken from the Greatness or Smalness of the Emission; the Signs of it are visible, or rather most sensible and uneasie to the Patients, because Shame and Vexation hinders them sometimes from seeking a Remedy; from whence the Prognostick may be made, That all of them are extreamly hard to be cured, the most part incurable; and that the Cure most commonly is but palliative.

Women are not subject to Fistula's, but only to this spilling of their Water, which is more uneasie to them, than to men, because of the Conformation of their *Urethra*, and that their Sex which hath Modesty for its Property, obliging them to a greater reservedness, hinders them from seeking relief: and this makes them to have Clouts or Spunges about them to receive the Water, or to employ something else, that Necessity and Uneasiness suggest to them.

When the Spilling of Urine remains with men, they may have recourse to a little Engine, such as I saw in the Possession of a Person, whose Character and

Quality allows me not to name him; I have heard him say, that it was very useful and commodious for him.

That Engine is made of Steel, Iron, or any other convenient Metal: It is composed of two parts, each about three Inches long, and a Fingers breadth wide; one of the two pieces bends a little in its Longitude, and the other is straight; these two pieces joyn together at one end with a turning joynt like a Compass, and at the other end both are bent backward to fasten within one another, so that pressing with the Finger, they may be opened and shut. These two pieces are covered with Linnen, as much, or as little as one pleases; afterward the Yard is put into that Instrument, observing to keep the crooked part uppermost; and when one hath made water, it is shut: the Compression may be made as slightly as one pleases, covering or facing the Engine more or less, that it may be suffered without Pain, & letting the Urine pass through, which in some manner supplies the action of the Sphincter of the Bladder.

I have seen some who have made use of

of Boxes of White Lattin, or other Veſſels of Leather made in form of an Urinal, tied to a Girdle, and wherein the Nut always hung, which is not done without Pain and Trouble. There is another Inſtrument much like to a Truſs, for ruptures; it is made like the Steel Truſſes, having a Girdle of the ſame Faſhion, and on the left ſide, inſtead of a Bolſter, the end of the Girdle bends Elbow-ways downwards, and terminates in the ſhape of a ſmall Iron Plate, which is covered with Felt, Leather, or Cork, ſufficiently waxed over, that it may be of a convex Figure like an Olive, and indifferently hard, that it may exactly anſwer to the *Urethra* above and near to the place where the Inciſion hath been made. When the Bandage is applied, the little Eminence preſſes the *Urethra* below the Cods, and to keep it firm, it is made faſt by the other end, where there is a ſtrap of Leather of the ſame faſhion as in the Steel Truſſes for Ruptures; and beſides, if a man were troubled with a falling down of the Inteſtines, one of theſe Truſſes might be made on purpoſe for him, where

where there might be a Bolſter for the Rupture, and the little eminence for compreſſing the *Urethra*, and hindring the ſhedding of the Water. Though this Bandage or Truſs be in effect only for a palliative Cure of this Diſtemper, yet it may ſometimes ſerve for a real Cure, becauſe hereby the parts gather ſtrength, and are corroborated.

There is another kind of Bandage ſtill, the Girdle whereof is made of Fuſtian, and that part which is to paſs upon the *Pubis* of a piece of Wood of the length and bigneſs of the Patients Finger, covered with Fuſtian and Wax, betwixt which and the *Pubis*, the Yard being compreſſed, lyes along looking upwards; that Poſture hinders the ſpilling of the Water: The ſame Bandage hath Points faſtned to the fore part of it, that they may be carried betwixt the Thighs, and tied ſide-ways to the Girdle, that ſo the Bandage may not riſe too high.

Involuntary voiding of the Excrements is cauſed ſometimes by the Chirurgeons Fault, if in time of Lithotomy he make the Inciſion too low, and if he

he cut the *Rectum*, especially in the lesser Operation, if he take not good heed; most frequently the violent Motions of the Patient contribute to it, but much more Putrifaction, Abscesses, or other Accidents that follow the Operation.

Their Kinds, Signs, and Prognosticks, are taken from the more or less Ejection of the Excrements by the remaining Fistula, which is far more uneasie than the spilling of the Water, or the Fistula alone. The Cure of this stercoral Excretion is impossible, when it is caused by Incision of the upper part of the Sphincter of the *Rectum*, or when there is great loss of Substance; if any pretend to take such Patients into Cure, they are to observe the Method of curing Fistula's in the *Anus*.

We need not enlarge to prove, that these kinds of Distempers may have several Causes concurring at the same time; when many of these Indispositions happen together, we must have our recourse to the Method of curing complicated Distempers, as well for the Prognostick Part, as for the order of the Complications.

CHAP.

CHAP. XXIII.

Of Medicines to prevent the Stone, for avoiding of the Stone, and of Medicaments for dreſſing thoſe that are cut.

THough we promiſed to enquire into the Medicines that may prevent the Stone; we muſt, however, confeſs, that it is very difficult, and perhaps impoſſible to determine preciſely wherein they do conſiſt; becauſe the moſt learned in natural Diſcoveries, ſpeak only in general of the Figures of Bodies, and Microſcopes have not been able to make known the particular Nature of every one, nor yet of all their Pores. Poſſibly we might ſucceed without obſerving all theſe Particularities; for though Enquiries into Nature were purſued to that very point, yet ſtill there would be cauſes that did not depend on us, and which might form the Stone; the Bigneſs, Figure, Number, and Motion of the Particles of Bodies of which we are compoſed, and of thoſe which ſerve us for Food, are no ways in our power; though theſe things be ſufficient to pro-

duce

duce in us the Maladies that we fear, if the Secretions and Excretions be not performed according to the Courſe of Nature. That we may reap Benefit from the Miſeries of others, it is to be conſidered, that they who are moſt ſubject to the Gravel or Stone, live after ſuch a manner, as may be avoided, or at leaſt corrected by other means; and ſeeing we have ſpoken of fenny and marſhy Places, groſs and thick Air, calculous Food, muddy Waters, and of the Exceſſes that may much debilitate the Parts of the Body, they are carefully to be avoided, uſing moderately thoſe things that are for our Nouriſhment, following Exercifes ſuitably to our ſtrength, without affecting too much Niceneſs and Delicacy: It were better to uſe a little too much, than not enough; becauſe Life conſiſts in Action, and men love themſelves too well, not to repoſe and take their Reſt; if we be not guilty of Exceſſes, the Parts of our Body continue in good Health, ready to reſiſt all attacks.

Though few things contribute more to the forming of the Stone in the Bladder,

der, than continuing long without making of Water, yet we must not at first give Diureticks, but only gentle Purgatives to empty the Intestines and adjoyning Parts: of that kind are *Manna*, *Cassia*, *Catholicum duplex*, *Lenitive Electuary*, *Diaprunum simplex*; a day or two after, *Turpentine* prepared in this fashion, may be given in drink: Take an Ounce, or Six Drachms of the best *Turpentine* unwashed, dissolve it in a Mortar with a little of the yelk of an Egg, then add to it two or three ounces of the Water of Winter-Cherries, Smallage, Pelletory of the Wall, or of some other Liquor, according to the Nature of the Disease, and the state of the Patient: Stir all together that it may be exactly mixed, and become of so white a Colour, that it looks like Cream or coagulated Milk. *Bever. C.* XI. of the Stone of the Kidneys and Bladder. The Bath gives ease to those that are troubled with the Stone, and contributes much to the bringing away of little stones that stop in the Kidneys and Bladder.

The

The uſe of the following Ptiſanne, or Barley-water, is very good againſt the ſame Diſtempers: It is made with an Ounce of *Linſeed*, and the Roots of Mallows and Marſhmallows, of each two Ounces, put into five quarts of water boyled away to four; into three Ounces of this Ptiſanne may be dropped four or five Drops of the Spirit of Sulphur, and it may be made ſtronger by augmenting the Doſe of the Ingredients in the ſame quantity of water: It is approved of for making one void Water, mitigating Pain, and bringing away Stones.

The two following Receipts were given me by *Monſieur Jonnot*, the firſt of which, he told me, hath often (to his Experience) been ſucceſsful in eaſing Nephritick Pains, and thoſe who are ſubject to void ſmall Stones; and that the ſecond never failed him, provided the Stone be of a Bigneſs fit to come out of the *Pelvis*, or Baſon of the Kidneys.

The firſt Medicine is to be taken in the Spring and Fall, every Morning for three days together. Take ſix Ounces of the Water of Pellitory of the Wall, an Ounce

Ounce of the Oyl of ſweet Almonds, and an Ounce and a Half of the Syrup of Limons; in caſe of neceſſity, it is taken at any time.

For the ſecond Remedy, the Patient muſt be once or twice blooded, and twice purged with two or three Drachms of *Sena* infuſed overnight in the Decoction of Dogs-graſs, Roots of Marſh-mallows, and a little bundle of Flax; to the Colature of which muſt be added an Ounce of cleaned *Caſſia* for every Doſe: The day after he is to make uſe of the following Limonade, and is to continue it three days ſucceſſively in the waning of the Moon, faſting three or four Hours after.

Take of Argentine, or Wild Tanſey, Water Lentils and Creſſes, of each one Handful, let them boil half a quarter of an hour in a quart of water, when it is taken off the Fire, add to it the Juice and Rind of three or four Limons; let all infuſe together for the Space of four Hours, then ſtrain it, and add thereunto three Ounces of the Powder of Sugar-Candy, and twenty Grains of the Spirit of

of Salt: Keep it for the Uſe aforeſaid.

The Garden-flags, or blew *Flower-de-luce* that grows upon Walls, infuſed cold into what quantity one pleaſes of White-wine, and an Ounce of the Infuſion, taken for the firſt time by Children of ten or twelve Years of Age, brings away the Stone: The Doſe is to be increaſed or diminiſhed, according to the Age of the Patient and its Operation, giving always too little, rather than too much, for fear of drawing the Stones in too great abundance towards the Sphincter of the Bladder, which would cauſe a ſuppreſſion of Urine. One may renew it two or three days after, and Purge by the Advice of a Phyſician. The uſe of White-wine, Raddiſh-water, and Wine made of the Fruit of Eglantine, or Sweet Briar, taken now and then, is good.

Paracelſus, in the end of the Preface to his ſecond Treatiſe of his great Chirurgery, preſcribes for remedying the ſuppreſſion of Urine, the uſe of the ſtones that are found in the Heads of Crabs, beat into a ſubtil Powder, drank in the

Juice or Water of Raddiſhes, and if the Patients do not thereby make water, to make a little bag of Saffron, and lay it upon the Kidneys, or the Belly, towards the paſſage of the Ureters, and upon the *Perinæum*: Or to make a Powder of dried Acorns, and give it to be drank in the Water or Juice of Raddiſhes, in what quantity the Phyſician ſhall judge fit.

The two following Medicines are approved of for bringing away of Sand and ſmall Stones. In the wain of the Moon, the Patient being Purged, let him take in the Morning the bigneſs of a Nut of freſh Butter, and ſwallow it down like a Pill; then let him take a ſour Limon, and ſqueeze out the Juice of it into four Ounces of White-wine, let him drink that Potion a quarter of an hour after that he hath ſwallowed the Butter: This may be reiterated two or three days after, according to its effect, and then Purge again.

For the ſame effect, take a little white Onion, cut it into ſmall pieces, infuſe them over Night upon hot Embers in four Ounces of White-wine, and ſtrain it;

it; having taken the ſame quantity of freſh Butter in the manner above directed, a quarter of an hour after drink of this Infuſion; it is more violent than the former. The Butter is taken firſt, that the Stomack may not be ſtung, or too much pricked by the Wine, the Limon-juice, or the Onion: And it is to be obſerved, that if the Patient ſhould but once take a greater quantity than theſe Doſes preſcribed, inſtead of giving eaſe, it would expoſe him to a ſuppreſſion again, becauſe theſe Medicines are very Diuretick, and carry rapidly along with them what they meet with in their way.

They ſay that Jet hath ſo much Vertue, that it is enough to hang it about the Arm, or to carry it in ones Pocket, to obtain eaſe of Nephritick pains, and to bring away the Gravel and Stone.

The cold infuſion of Nephritick Wood is Excellent; put what quantity of that Wood you pleaſe into water, to which it will give a Tincture; take of it two Glaſſes in the Morning, and one at Night, or at any other hour of the day, if the Stomack be empty; this Medi-

cine asswages the pain, and brings away Sand.

Pareus, Book 17. Chap. 37. describes the following Broth, and says, that he hath by Experience found it to be of marvellous Efficacy for hindring the forming and confirming of the Stone. Take a Cock and a Knuckle of Veal, boyl them in water with a handful of Barley, Parsley-Roots, Sorrel, Fennel, Sichory, Butchers-broom, of each an Ounce; the four cold Seeds bruised, of each half an Ounce; towards the end, add Sorrel leaves, Purslain, Lettice, Mallow-tops, and *March* Violets, of each half a handful; and then keep the Broth, of which the Patient for four Mornings together fasting, shall take about half a Pint with a little of the Juice of a Limon, making it boyl one turn over the fire, every time before it be taken; you will quickly see, says he, a wonderful Operation, and it is a Medicamental Aliment.

In the same place he gives the Receipt of a rare Powder against the Stone. R. *Nucleorum mespil.* Unc. 1. *Pul. elect. Diatrag.*

Diatrag. frigidi, Drach. 2. Quatuor ſeminum frig. majorum mundatorum, glycyriſæ raſæ ana drac. 1. Sem. Saxif. dr. 2. Seminum milii ſolis, geniſtæ, pimpinellæ, bruſci & aſparagi, ana Scrup. 1. Seminis Altheæ, dr. 1. ſemiſ. Sacchari albiſſimi, Unc. 6. fiat pulvis. This Powder is to be taken the firſt days of the New Moon and Firſt Quarter, of the Full Moon and Laſt Quarter; and ſo for all the Months after, to the quantity of a Spoonful in the Morning three hours before eating. For the ſame Effect he preſcribes the following Powder. ℞ *Coriand. præp. ſcrup. 4. Aniſi, Marathri, granor. Alkekengi, Milii ſolis, ana drach 2. Zinzib. Cinnamomi, ana ſcrup. 2. Turbith Elect. drach. 1. Carvi ſcrup. 2. Galang. Nucis moſchatæ, & lapid. Judaici, ana ſcrup. 1. Foliorum Senæ mundatorum ad duplum omnium, Diagredii dr. 2. Semiſs. miſce & fiat pulvis. Doſis erit ad drach. 1. Cum vino albo. Capiat æger tribus horis ante prandium.* Glyſters for aſſwaging Nephritick pains, are to be made of the Decoction of Lettice, Scariole, Purſlain, the Flowers of Violets and Nenuphur,

Melilot, Camomile, Dill, the leaves of Mallows, Marſh-mallows, Bran, and Linſeed; and in the Colature is to be diſſolved cleaned Caſſia, a little Sugar, yolks of Eggs, and Turpentine, which is a Soveraign Remedy.

Beverovicius ſpeaks of a great many Medicines; but ſeeing he may be conſulted, we ſhall here wave the Deſcription of them, and ſpeak only of Medicines that are uſed after the Operation, and for Remedying the Symptoms.

They have nothing that is particular, but that they ought to be more moiſtning and humectant than for the other parts. Every Chirurgeon makes his Aſtringent Powders, and other Medicines to reſiſt Putriſaction, and breeding of new Fleſh. Sometimes the Rumps of Pullets are dryed with a little Rock Allom Calcined, and ſcraped Lint; or elſe there is added to it the Powder of Burnt Lead malaxated with a very little Diapalma, or *de minio*: A very good Epulotick is made with an Ounce of Pompholix, half an Ounce of the Plaiſter *de minio*, two Drams of Rock Allom Cal-

Calcined, all incorporate together. In like manner a very good Deſiccative may be made of Bole Armoniack and the Litharge of Gold, of each an Ounce; the Salt of *Saturn*, and *Crollius* his Medicamental Stone, of each a Dram; all being reduced into a Powder, they are to be made into an Unguent with a ſufficient quantity of the Oyl of Roſes.

To remove the Calloſity of Fiſtula's, one may make uſe of the Powder which is found at the bottom of Sphagedenick Water: You may take what quantity you pleaſe of that Powder, let it dry in the ſhade, and then grind it upon *Porphyry-ſtone*, or Marble; add thereto a little Water, in which Gum Arabick hath been diſſolved, and make it up into long and ſmall Trochisks of divers ſhapes.

A more violent and efficacious Catheretick for the ſame purpoſe may be made of equal parts of Corroſive Sublimate, and Rock Allom Calcined, a little Opium and Saffron; all muſt be pounded together, and to give it a Body, add as much Gummed water as is neceſſary, and make it into Trochisks according to Art.

We ought not to forget the Deſcription of the Liniment of *Arceus*, which in Dreſſing ſerves for a Digeſtive: Thus it is deſcribed. ℞ *Gummi Elemni & terebinthinæ abietinæ ana Vnc.* 1. *Sem. ſævi caſtrati antiqui & liquefacti, Vnc.* 2. *Pinguedinis Porcinæ Vnc.* 1. *Miſce & ad ignem Linimentum facito.* *Arceus*, in his firſt Book of the good Method of Curing Diſeaſes, ſays, that this Medicine is of ſo great Vertue, that with half an Ounce of it one may Cure the greateſt Wounds, provided no Accident ſupervene; ſometimes they add to it as much of the Oyl of St. *Johns-wort* as is thought convenient, according to the intention that is had in uſing it.

Pareus gives the Deſcription of the Oyl of Eggs, *pag.* 752. Take the Yolks of hard Eggs, rub them betwixt your Hands, and fry them in a Frying-pan over a gentle fire, ſtir them with a ſpoon until they become red or tauny, and the Oyl come from them, then put them into a Hair-cloath, and preſs out the Oyl, as that of Almonds, and keep it for Uſe.

Here

Here we may ſubjoyn the Deſcription of Harts-horn Jelly, which is Excellent againſt the Looſeneſs that happens to thoſe that are cut of the Stone; it is made of two Ounces of the ſhavings of Harts-horn, and as much of Ivory, which are to be boyled in a quart of Water untill the Juice of them be Extracted: Then the Decoction is to be ſtrained through a Cloath, and the Colature clarified with the white of an Egg, adding thereto a little of the Juice of Limon, white Sugar, and Cinnamon; the Colature is to be ſet over the fire again, and when it begins to boyl, a white ſcum will riſe, then a little White-wine is to be put into it to ſettle the ſcum, and a little after, when the ſcum riſes again, ſome more White-wine is to be put into it; the Humidity is to be let evaporate, until one perceive that the Liquor becomes Glewy, then it is to be taken off, and quickly ſtrained through a clean Linnen Cloath, and put into Veſſels, to be kept for Occaſion: A ſpoonful or two of it is now and then to be given to the Patient, to ſtop his Looſeneſs.

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